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ORIGINAL ARTICLES

PRACTICAL EVALUATION OF GASTROSCOPY *

BY HERMON TAYLOR, M.D., M.Chir. Camb., F.R.C.S.
ASSISTANT FOR GASTROSCOPY TO THE LONDON HOSPITAL

(With Coloured Illustrations on Plate)

THE flexible gastroscope was first used in this country in 1934 by Mr. Harold Edwards at King's College Hospital, and in the following year I introduced it at the London Hospital. The purpose of this paper is to present the results of the clinical practice of gastroscopy at the London Hospital based on the analysis of 350 cases during its probationary period of four years from September, 1935 to September, 1939.

The patients were all dyspeptics in whom a definite indication for the gastroscopy remained after other investigations had been carried out. With few exceptions they were inpatients, if only for twenty-four hours, and together they represent about a seventh of the dyspeptic cases admitted to the hospital during the same period. Since twice as many patients were gastroscoped during the fourth year as during the first it may be inferred that the instrument has established for itself a place in the diagnostic equipment of the hospital. The list of cases, which includes 32 patients with normal stomachs, notwithstanding their symptoms, is classified in table I. This shows that 32% of all the patients had a local lesion, a third of these being carcinoma, while 28% were patients who had already had an anastomotic operation on the stomach. It seems from this that the instrument has been used with a surgical bias and such in fact has inevitably been the case, although as wide a scope as possible has been sought.

TABLE I—THE 350 CASES CLASSIFIED ACCORDING TO DIAGNOSIS

	No. of cases		
Normal stomachs	32		
Local lesions			
Carcinoma	34		
Ulcer	62		
Rarer conditions:			112
Innocent tumour	2		
Polyposis	2		
Diverticulum	4		
Sarcoma	1	16	
† Syphilitic ulcer	1		
Regional gastritis	2		
Œsophageal ulcer	1		
Extra-gastric distortion	3		
Diffuse lesions			
Mucosal hyperplasia with and without gastritis	44		
Mucosal hypoplasia or atrophy with and without gastritis	16		
Gastritis in mucosa of average type	18		84
Rarer conditions:			
Gastritis in phthisis	3		
Gastrostaxis	1	6	
Phlegmonous gastritis	1		
Hyperirritable stomach	1		
Stomachs after intestinal anastomosis (including 3 carcinomas)			
After gastrojejunostomy	86		
After partial gastrectomy	13		99
Failures			26

On 26 occasions (7% of the total) the examination has failed to achieve its purpose. The causes of failure are set out in table II, the cases being subdivided into those of absolute failure to pass the gastroscope into the stomach at all, and partial failure, in which a view of an essential part of the stomach could not be obtained after the instrument had been satisfactorily introduced. The commonest reason for partial failure is the invisibility of a pyloric antrum, which, in some cases of pyloric or duodenal ulceration, may be hitched up by inflammatory adhesions. The commonest cause of all failures, however, is distortion of the upper end of the stomach due to a high lesser-curve lesion. An inflammatory mass here may prevent the instrument from negotiating the leftward curve of the œsophagus as it passes through the diaphragm, or may produce a contraction band across the posterior wall of the upper part of the stomach. The pouch of gastric wall which is formed above the band receives the end of the gastroscope as it enters the stomach and no manipulation can prevent this. The condition is dangerous because the inflammatory softening of the wall of the pouch renders it particularly liable to perforation or detachment from the adherent ulcer, an accident which actually occurred in one case. There is no alternative but to abandon the examination if this complication is met with.

TABLE II—ANALYSIS OF 26 CASES OF FAILURES OF GASTROSCOPY, EXCLUDING STOMACHS AFTER ANASTOMOSIS

	No. of cases	
Absolute failures (failure to pass the gastroscope into the stomach)		
Distortion due to high lesser-curve lesions	6	
L-shaped œsophagus	2	
Small mouth and close teeth	2	12
Kyphosis	1	
Œsophageal stenosis	1	
Partial failures (failure to view a particular part of the stomach essential to the purpose of the gastroscopy)		
Distortion due to high lesser-curve lesions	5	
Distortion by extra-gastric adhesions	2	14
Failure to view pyloric antrum	7	

There have been no other untoward events in any of the cases and in general, unless the patient has had a full set of teeth (a rare circumstance in the chronic dyspeptic), there has been little or no distress at the time of the examination or discomfort afterwards.

Carcinoma

A growth was observed in 34 cases; this figure includes 6 instances in which the presence of the carcinoma was already known and the gastroscopy was carried out to determine its operability. Actually gastroscopy is of little value in these cases, for though it may sometimes be useful to know whether the amount of mucosa above a growth is sufficient for partial gastrectomy the observer cannot exclude subperitoneal infiltration of the gastric wall above the growth, nor can he detect distant metastases. Gastroscopy is thus rarely justifiable where the presence of a growth has already been determined.

In the remaining 28 cases of observed carcinoma the patients were gastroscoped in order to establish the diagnosis; in these patients radiographic and other investigation had not discovered the condition. Indeed, the finding was unexpected in 14 cases, while in the remaining 14 previous investigation had failed to confirm clinical suspicion. Carcinoma was excluded in 68 cases in which its presence had been suspected. Altogether, there were 82 subjects in which the diagnosis of carcinoma was not excluded by other methods of investigation, and the question was settled by gastroscopy in every instance, 14 growths, mostly small, being discovered.

Negative results of gastroscopic search for a growth abolish the lingering doubts which formerly might have led to an exploratory operation. I have tried to estimate the degree of suspicion with which each case was regarded prior to the gastroscopy. I found that, according to old standard, doubt was sufficient to justify laparotomy in at least 25 instances.

OPERABILITY

During the four-year period in which the present series of dyspeptic cases was collected the hospital admitted 321 cases of carcinoma of the stomach. This figure does not include cases which were obviously hopeless when first seen in the outpatient department, but only those in which treatment was considered possible. Most of these patients were diagnosed without instrumentation, but 28 of them (9%, table III) had growths small enough to require gastroscopy for their discovery. Only 70 of the 321 cancers were resectable, but no less than 19 of these belonged to the group of 28 cases diagnosed by gastroscopy. The operability-rate of 68% in this group contrasts sharply with the rate of 17% in the larger group of cases diagnosed without gastroscopy. Few of the 19 resections in this group would have been performed if gastroscopy had not established the diagnosis. As a

* Hunterian lecture delivered at the Royal College of Surgeons on Jan. 24, 1940.

result of gastroscopy, therefore, the number of cases of carcinoma of the stomach successfully removed in the period under consideration was increased by more than 30%. These figures are too small to form a statistical basis for generalisation, but they do suggest that the gastroscope has made possible a considerable improvement in the results of treatment of carcinoma through the early diagnosis of small or obscure growths.

TABLE III—OPERABILITY-RATES OF 321 CARCINOMA CASES ADMITTED TO THE LONDON HOSPITAL IN FOUR YEARS

	Diagnosed without gastroscopy	Diagnosed by gastroscopy
Inoperable	242	9
Resected	51	19
Total	293	28
Operability-rate ..	17%	68%

Gastroscopy is useful in the early stages of both ulcer-cancer and primary cancer of the stomach. The presence of an ulcer is usually known, but its nature is in doubt and can be elucidated by the gastroscope. The identification of a primary cancer, once discovered, is seldom difficult, but small tumours may escape radiological detection. Such instances are rare, but they are the most favourable cases and it is important not to overlook them.

CASE 1.—A woman of 57 who for four years had experienced occasional vague abdominal discomfort, amounting during recent months to pain, coming on about an hour after food and relieved by rest or medicine. Radiography suggested a lesser-curve ulcer. When the patient was admitted to hospital her symptoms had gone; she had no anæmia, satisfactory test-meal acidity (0·11% HCl at one hour) and a radiogram now showed no abnormality. On gastroscopy the stomach presented the appearance indicated in fig. I. The general mucosa was of average type, but on the posterior wall near the lesser curve was a small nodular congested plaque with an unbroken surface. At a second gastroscopy after a short course of medical treatment I found no change in the appearance and reported the condition as early carcinoma. Operation was undertaken by Sir James Walton on the gastroscopy findings alone, and against the weight of clinical evidence. When the abdomen was opened there appeared to be no lesion in the stomach. Palpating the area of the plaque observed endoscopically, Sir James said he found "perhaps a little thickening, but it does not feel like a carcinoma." Nevertheless, partial gastrectomy was carried out, and fig. VI is a sketch of the specimen turned inside out. The lesion was about 1 cm. in diameter, with a slightly nodular surface; on palpation the edge gave the examining finger the same sensation as the edge of an area of erysipelas. From the peritoneal surface the induration could hardly be detected at all. Microscopical section showed an unbroken epithelial surface with small groups of carcinoma cells at the base of the gastric glands on the muscularis mucosæ.

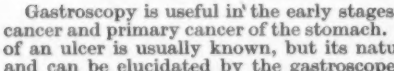

FIG. VI

This case is perhaps a freak, but it is a striking example of the value of gastroscopy in the early diagnosis of small growths in the stomach. It is, I believe, the smallest carcinoma diagnosed before operation.

THE TWO-VIEW TEST FOR MALIGNANCY

In the early stages naked-eye evidence of malignancy in an ulcer is often lacking, even in the excised specimen, and the same limitation naturally applies to a single gastroscopic inspection. Disillusionment awaits the gastroscopist who attempts to decide at one examination between innocent and malignant ulceration on minor details in the ulcer crater or its mucosal setting. But the changes that occur in the living specimen, preferably recorded by careful drawings of the appearances, can be relied on to determine the nature of the lesion. Where the malignancy of an ulcer is in question a second gastroscopy should be carried out after three weeks of intensive medical treatment. If the lesion is innocent obvious signs of healing will be present; if it is malignant the appearance will probably be unchanged, although nodulation or infiltration of the edge may possibly be more noticeable. I have come to accept the failure of an ulcer to change at all under intensive treatment in hospital as sufficient evidence of malignancy. I have had occasion to regret in some of my earlier cases that I have not taken a more serious view of lesions which have failed to show signs of healing under treatment, merely because they have shown no apparent progression. On the other hand, if at the second inspection an ulcer shows signs of uniform healing, malignancy can be definitely excluded (figs. IIA and B). Signs of healing are the shallowness of the ulcer, a clean yellow base, the absence of froth of fermentation in the crater, the subsidence of œdema and absence of nodulation in the margins, and the development of a stellate contracture pattern in the surrounding mucosa. These signs collectively exclude malignancy. If some but not all are present I examine the lesion a third time, after further treatment, before making a decision.

CASE 2.—A man of 49 with eighteen months' history of attacks of epigastric pain two hours after food, relieved by taking powder. His appetite was good, but there was slight loss of weight and examination revealed some epigastric tenderness. Acidity was normal (0·07 HCl at one hour). The radiogram suggested a lesion in the pyloric antrum but gave no indication of its nature. Gastroscopy (fig. VA) showed some hyperplastic gastritis, and an ulcer on the anterior wall of the pyloric antrum; the ulcer was of moderate depth, with a clean yellow base and clear-cut margins, but a rather irregular surrounding mucosa. No good evidence of malignancy was reported. After four weeks, a second inspection (fig. VB) showed signs of healing in the proximal part of the ulcer, but a curious low mound of mucosa was observed on the further edge which prompted yet another view. This was carried out after a period of three weeks which the patient spent at a convalescent home; he was by that time fit, bronzed and symptom-free and had put on weight. The lesion (fig. VC) now showed little change; the mound of red mucosa on the edge of the ulcer was still present and the base of the ulcer was obscured by fine froth.

Fine adherent froth, as distinguished from individually visible bubbles, appears to be due to fermentation; I have never observed it in the base of a peptic ulcer and now regard it as highly suggestive of malignancy. This, and the unchanged nodulation in one part of the ulcer I would regard today as evidence of neoplastic change in the ulcer. At that time, however, I was accumulating experience and I continued to watch the patient.

He returned to work, kept well, and wrote to me every month for four months, his only complaint being of occasional tiredness, which he put down to his diet. A fourth inspection after two months still showed little change except that the mound of mucosa on the far side of the ulcer was a brighter red and more prominent, again with froth round it. The fifth and final gastroscopy (fig. VD), six months after the first, left no doubt as to the malignant change in the ulcer, where a plaque of rigid tissue had spread from the red nodule so constantly observed, round to the proximal part of the crater. The patient was still at work, enjoying his food, and symptomless except for his tiredness. A partial gastrectomy was carried out by Sir James Walton. The specimen showed an ulcer with a raised mass of soft tissue above it; on section, the appearances were those of chronic peptic ulcer with a typical glandular hyperplasia in the adjacent mucosa, and early carcinoma in one edge.

This case was an early one in which conclusions were only reached hesitantly. Nowadays a positive two-view test has come to depend almost solely on the absence of change in a lesion after a period of strict treatment.

CASE 3.—A man aged 42, with five years' history of indigestion (attacks of pain 1 to 1½ hours after food and often at night, relieved by powder or by vomiting). Appetite good, but vomiting had increased and there was some loss of weight. Abnormal physical signs were absent. The test-meal showed achlorhydria, but the radiologist reported an ulcer in the pyloric antrum. Gastroscopy showed some gastritis and a prepyloric ulcer with edges of uniform thickness, rather lumpy, in an area which failed to transmit a peristaltic wave.

This was reported as suspicious. A second inspection after three weeks' treatment showed no change in the lesion, and this indicated definite malignancy. A radical gastrectomy was carried out. Subsequent histology confirmed the gastroscopic diagnosis.

The test thus involves a stay of three or four weeks in hospital. If the ulcer proves to be innocent this period becomes a part of the course of treatment. In the malignant case the patient's general condition often shows considerable improvement and the duration of the test becomes a valuable resting phase in which he can build up his vital resources in preparation for an operation with a mortality-rate in the region of 30% (Walton, Gordon Taylor, Lahey and others).

TABLE IV—TYPE OF CARCINOMA AND TYPE OF MUCOSA IN 19 EARLY CASES

—	Ulcer cancers		Primary cancers	
	Hyperplastic mucosa	Normal mucosa	Normal mucosa	Hypoplastic mucosa
No. of cases ..	4	6	7	2
Av. HCl (per cent.)	0·15	0·12	0·10	Nil

I have applied the two-view test on 22 occasions; in 8 instances I was able to show that a supposedly innocent ulcer was neoplastic and in 14 cases ulcers were proved innocent when all other evidence consistently indicated malignancy. Many of the latter cases were so alike and simulated the cancer syndrome so closely that they justify grouping together as a distinct clinical type. Nearly all of them occurred in people over sixty, with a short history of loss of appetite, loss of weight and severe epigastric pain. Radiography showed in each case a large ulcer; in most of them there was no free HCl in the test-meal. Apart from the two-view gastroscopic test, therefore, the evidence in each instance was damning. But in these cases the ulcers have healed rapidly with medical treatment, and the patients were of an age which would have rendered even more risky the gastrectomy they were able to avoid.

Sir Arthur Hurst is of the opinion that primary cancer hardly ever develops in a normal gastric mucosa, and it is useful to consider the types of mucosa associated with ulcer-cancer and primary cancer. In my series only 19 of the carcinoma cases were early enough for the origin of the growth to be apparent, 10 of these being ulcer-cancers and 9 primary cancers (table IV). In the ulcer-cancer cases the mucosa was hyperplastic in 4 (average acidity 0·15% HCl one hour after the test-meal) and of average type in 6 (average acidity 0·12). In the primary cancers the mucosa was of average type in 7 cases (average acidity 0·10) and hypoplastic in 2 (acidity nil). These figures give some support to Sir Arthur Hurst's hypothesis, but suggest that it is going too far to say that carcinoma rarely arises in a mucosa of average type; indeed, no fewer than 13 of the 19 cases of carcinoma of identifiable origin had normal mucosæ.

TEST-MEAL AND THERAPEUTIC TESTS

It is true that as a rule achlorhydria is associated with carcinoma of the stomach, but unfortunately it has become almost a diagnostic criterion of the condition. Yet in two-thirds of the early cases here considered, all of which had growths small enough or dubious enough to require gastroscopy for their diagnosis, not only was acid present but often, in the ulcer-cancers, there was a raised test-meal acidity. Does this not suggest that achlorhydria stands in the same diagnostic relationship to carcinoma of the stomach that axillary metastases occupy in relation to carcinoma of the breast? Just as carcinoma of the breast must be diagnosed before the development and without the assistance of palpable axillary glands, so our aim must be to diagnose carcinoma of the stomach before the development of achlorhydria. Achlorhydria may support a diagnosis of advanced carcinoma of the stomach, which is usually only too obvious, but the presence of hydrochloric acid in the gastric juice of a suspicious case does not exclude early carcinoma. In short, a test-meal in suspected early carcinoma of the stomach is more likely to camouflage its presence than to facilitate its detection.

The so-called therapeutic test for malignancy is also fallacious. Carcinoma of the stomach, even in its early stages, is often accompanied by gastritis. The evidence is at present insufficient to determine whether the gastritis is primary or secondary to the tumour or both, but there is little doubt that the early symptoms, if the patient is fortunate enough to have any, are referable to the gastritis and not to the neoplasm. If the case is treated blindly the gastritis subsides, the symptoms disappear, and the growth is only discovered too late. Of the 8 cases of ulcer in which the two-view test established neoplastic change only 1 patient failed to improve between the two examinations and 5 became quite symptomless, with full return of appetite and vigour and increase in weight. The satisfactory reaction of the patient to treatment is *not* sufficient to exclude malignancy. If other investigations fail to establish carcinoma in a person whose dyspepsia commences or changes over the age of forty, gastroscopy is imperative. Only thus is there hope of improvement in the mortality from this disease.

Unfortunately this new approach leaves unsolved the central problem of carcinoma—that the majority of patients fail to seek advice until their condition has become too obvious and too hopeless. Nevertheless, the gastroscope has given us a means whereby the diagnosis of carcinoma of the stomach need never be left in doubt in those more enlightened persons who present their dyspepsia for investigation.

Gastroscopy in Dyspepsia

If patients were merely specimens endoscopic inspection of the gastric mucosa might be demanded in all cases. But since they are human gastroscopy can only be pressed for where the possibility of malignancy remains after a negative or inconclusive radiological examination. Other indications are less urgent, but gastroscopy is advisable where constant recurrence of symptoms or incomplete relief from them suggests that a more exact investigation than radiography or test-meal is needed. Often—in this series 32 times—the stomach is discovered to be normal, in spite of the gastric symptoms and a complete reorientation of the case follows; or the examination may reveal an unsuspected ulcer, the presence of antral spasm, or perhaps a diverticulum, conditions which lead to essential modification of treatment.

Apart from such complications, it is often important to determine the stage of healing in gastric ulceration, since old-standing lesions with much cicatrisation may resolve extremely slowly. Long after the symptoms have quite disappeared in such patients a crater can be seen to persist as a mucosal scar so shallow and devoid of œdema in its margins that it casts no X-ray shadow after a barium meal. Early return of symptoms commonly follows premature relaxation of the therapeutic regime after a negative radiogram, and the ulcer is said to have recurred. With gastroscopic control both patient and clinician are encouraged to persist with treatment until the crater has gone and the distortion of the scar has subsided.

Impending hæmatemesis from an ulcer may reveal itself by the visible extravasation of blood through the softened wall of an artery lying beneath it. This process seems to continue for some time before the vessel itself gives way, and the seepage results in a low, velvety, cushion-shaped, pinkish mound in the yellow base of the ulcer. I have observed this appearance three times, my attention being first drawn to it in the following striking case.

CASE 4.—A man of 48 with long-standing, periodic attacks of dyspepsia, and a fairly recent hæmatemesis, was admitted to hospital under Dr. Horace Evans. Investigation established the presence of a lesser-curve ulcer, but as there was little relief of pain after two weeks' treatment, gastroscopy was requested. A close-up view was obtained (fig. III) of a deep chronic ulcer with an acute erosion of its anterior margin. The crater was occupied above by a low reddish mound and below by a longitudinal ridge in contact with which, as it disappeared beneath the undermined lower edge of mucosa, lay a dark purple clot. Partial gastrectomy was successfully performed by Sir James Walton, a large ulcer being dissected off the pancreas. The lifeless tissue of the specimen retained only a colourless suggestion of the striking endoscopic picture,

but a bristle passed up the coronary artery lifted the clot off the base of the ulcer. The patient made a satisfactory recovery.

In the two later cases the mound of blood seepage from the vessel was represented by only a faint, pinkish elevation in the ulcer crater, and would have passed unrecognised but for the above experience. One of them was operated upon and an artery was again found beneath the ulcer, separated from the base of it by about 2 mm. of soft tissue.

Mucosal Types

Gastroscopic evidence has lent increasing support to Hurst's view that people tend (probably from birth) to have gastric mucosæ of different types—normal or average, hyperplastic and hypoplastic. An atrophic mucosa must be considered an acquired pathological condition in itself, associated with definite derangement of function. Hyperplastic and hypoplastic states appear to be physiological variants from the standard and are not essentially associated with disturbance of function. They are, however, particularly susceptible to gastric disease; 75% of the patients in my series had one or other of these types of gastric mucous membrane, although Hurst suggests a general incidence of 20%. Moreover, by watching the progress of treatment gastroscopically, it has become clear that while the superadded gastric disease can be cured or mitigated the type of mucosa remains unaffected, at least over a considerable period.

It is essential to establish a clear conception of what constitutes normality, hyperplasia and hypoplasia. The degree of rugosity of the mucous membrane is a guide, since hyperplasia involves multiplication of the number of gastric glands, and the resultant increase in area of mucous surface causes the rugæ to become higher, more tortuous, more numerous and closer together (fig. IVA, B and C). It is important to distinguish between the degree of rugosity, which appears to be constant for the individual, and the degree of gastritis (indicated by œdema of the folds, congestion, petechial hæmorrhages, erosions and excess of mucus), which may vary with circumstances. The rugæ correspond to the acid-secreting area of the mucosa and are absent from the pyloric antrum and lesser curve, being concentrated mostly on the greater curve, to a lesser extent on the posterior wall and to a lesser extent still on the anterior wall. These relationships hold good whatever the type of mucosa. The height and shape of the folds in a particular stomach further depend on the degree of distension, since they become first straightened out and then flattened as the stomach wall stretches. A number of considerations are therefore involved in the estimation of the type of mucosa in any one case, and some standardisation is necessary if conclusions are to be sound.

The normal or average stomach which I have adopted empirically is one which on slight distension presents the rugæ as fairly straight clear-cut ridges with flat troughs between them though the folds on the greater curve may be a little tortuous (fig. IVA). First the anterior, then the posterior wall folds are abolished by further distension, while the greater-curve rugæ lose their tortuosity and steepness.

An atrophic mucosa is so thin and translucent that submucous vessels are clearly visible through it and no folds arise even in the collapsed stomach. A hypoplastic stomach has a thicker mucosa but only a few straight folds on the greater curve, which are easily abolished by distension (fig. IVB).

It is useful to recognise two degrees of hyperplasia. In the mild form the anterior rugæ can still be abolished by distension but the posterior ones persist, and those on the greater curve retain to some extent their tortuosity. In severe hyperplasia all the rugæ are tortuous and crowded together, and full distension does no more than separate and perhaps straighten those nearest the lesser curve (fig. IVC). These appearances are the expression of the degree of development of the gastric mucosa in different patients, and may be conveniently assigned numerical units. Thus the normal mucosa (+ +) is graded between hypoplasia (+), on the one hand, and hyperplasia, moderate (+ + +), and severe (+ + + +) on the other.

The height of the gastric acidity and the degree of development of the mucosa correspond, but the amount of variation in the acid secretion in patients with similar mucosæ is remarkable. Thus, in the 32 normal stomachs of average-type mucosa (+ +) without gastritis the average one-hour test-meal figure was 0·10% HCl, but this varied among the cases between 0·25% and nil. The symptoms in these cases were not derived from the stomach, and the variability in such reflex secretory activity is not remarkable. But it is obvious that no deduction as to the type of mucosa can be based on the level of gastric acidity in a particular case. Similarly, in a group of 18 cases of gastritis with average mucosæ, the mean one-hour test-meal acidity was depressed to 0·04% HCl, with individual variations between 0·08% and nil. The general inhibitive effect of gastritis on the average secretion is apparent, but the variability does not reflect the intensity of the gastritis, since it occurs in uninflamed stomachs.

In hyperplastic stomachs, with and without gastritis, 13 with severe hyperplasia (+ + + +) had an average acidity of 0·24% HCl with individual limits of 0·33 and

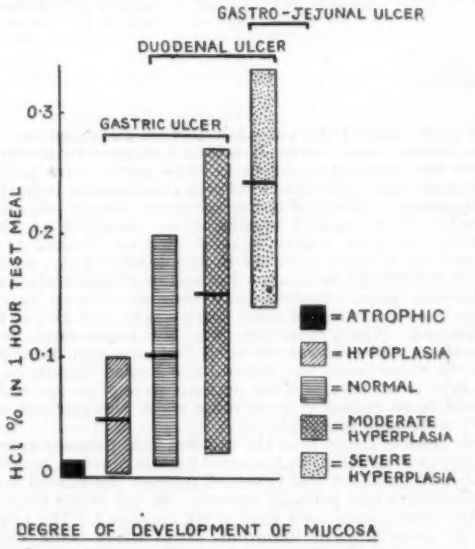

FIG. VII—Mucosal types, acidity, and incidence of peptic ulcer. Shaded areas show limits of variation in individual cases; the average figures are indicated by cross lines.

0·15; 48 with moderate hyperplasia had an average acidity of 0·14% HCl and a range of 0–0·3 (fig. VII). While, therefore, hyperacidity is associated in general with hyperplasia, and hypoacidity with hypoplasia and gastritis, individual cases vary through such a wide range that their acidity is not a reliable indication of either the type or condition of their gastric mucosa.

Gastric ulcers tend to arise more often in hyperplastic stomachs, but many occur in normal mucosæ. Thus, 35 gastric ulcers in my series were associated with hyperplasia, but 16 others were in mucosæ of average type and 4 occurred in distinctly hypoplastic mucous membranes. Gastritis, however, was present in all cases of active ulceration and it seems that though a raised acidity increases the tendency of an inflamed mucosa to break down a normal or even subnormal acidity may digest a mucosa in which resistance has been depressed by chronic inflammation.

Duodenal ulcers appear to be invariably associated with a hyperplastic mucosa—usually of a more marked degree than in gastric ulcer so much so that absence of hyperplasia in the gastric mucous membrane is strong evidence against duodenal ulceration.

The assessment of a case of dyspepsia, whether due to diffuse gastritis or localised ulcer, fundamentally depends on the type of gastric mucosa; and only the gastroscope can determine this precisely. Thus, by taking into account the degree of hyperplasia of the mucosa, as well as the extent of scarring and distortion round an ulcer, the gastroscopist can give a good opinion as to the prognosis and treatment of the case. He can decide whether

the ulcer can be expected to heal and remain healed on a conservative regime, or whether this is so unlikely that surgical treatment should be undertaken, without further loss of time.

Gastro-jejunal Ulcer

The severest form of hyperplastic gastritis is found in patients with persisting or recurring symptoms after gastro-enterostomy for peptic (usually duodenal) ulcer. The worst cases are those which have progressed to anastomotic ulceration. It has been said that the stoma itself is responsible for the hyperplastic gastritis, but I disagree. The type of mucosa tends to remain constant for the individual, and the hyperplasia at least must have existed before the original ulcer for which anastomosis was made. Such a mucosa is inevitably subject to recurrent attacks of gastritis, both before and after the operation, which result in duodenal and anastomotic ulcers respectively. The pathology is basically the same in each case and there is no evidence of different origins for the earlier and later phases of an essentially continuous process. The stoma has been incriminated on the grounds that the hyperplastic gastritis is severe and localised to the region of the opening. A posterior gastro-enterostomy opening is placed at the site of greatest anatomical rugosity—the greater curve and posterior wall. Naturally hyperplastic gastritis appears prominent here, but it is important to distinguish between the hyperplasia (the rugosity) and the inflammatory changes. I have examined 86 patients with symptoms after gastro-enterostomy, mostly for duodenal ulcer, and in none have I found any special concentration of inflammation of the gastric mucosa towards the stoma, except at the suture line itself or near an established ulcer. Of the original ulcer cases only those with the greatest mucosal hyperplasia would be likely to go on having symptoms in spite of the gastro-enterostomy; the milder cases would be cured by it. I have persuaded 3 control cases (an inadequate number) to be gastroscoped. They were patients who had been continuously symptomless for some years after gastro-enterostomy for established duodenal ulcer. The hyperplasia was only moderate in each case and none showed any evidence of gastritis (in spite of their stomata). It appears therefore that the operation of gastro-enterostomy, which can be relied on to cure a duodenal ulcer, is safe from the complication of gastro-jejunal ulcer only if the degree of hyperplasia in the gastric mucosa is not excessive.

This conclusion suggests a new approach to the surgical treatment of duodenal ulcer—namely, that the operation chosen should depend on the degree of gastric hyperplasia observed endoscopically. The bulk of cases, with a moderate degree of hyperplasia, should be treated by gastro-enterostomy; partial gastrectomy should be reserved for those with severe hyperplasia. Such a selection of cases would combine the advantages claimed both by the conservative surgeons and the gastrectomists, and offers a prospect that the incidence of gastro-jejunal ulcer will be diminished.

DIAGNOSIS OF GASTRO-JEJUNAL LESIONS

Cases with persistent symptoms after gastro-jejunostomy or gastrectomy present unusual difficulties to routine gastric investigation. The test-meal acidity is of little value in view of the presence of the stoma, and the radiographic silhouette is often obscured by the anastomosed loop of jejunum which is superimposed on the stomach, as well as by distortion in the region of the stoma itself. Recurrent attacks of gastritis in a hyperplastic stomach after gastro-enterostomy produce much the same symptoms whether or not an anastomotic ulcer is present, the difference being mainly one of degree. Gastroscopy is often the only satisfactory means of investigation, but may present considerable technical difficulties. Postoperative or inflammatory distortion of the stomach, or a stoma rotated to the right, may obstruct a view of the anastomotic margin altogether. This has occurred 7 times in 99 cases and on 9 other occasions only a partial view of the stoma has been obtained. On the other hand an exact diagnosis was established in 80% of the cases—mostly patients with whom little progress had been made beforehand.

Table V shows the variety of gastroscopic findings in patients who have had a gastric anastomosis performed. In the gastro-enterostomy cases persistent diffuse hyperplastic gastritis without ulceration is the most frequent finding (table V), but local lesions include 3 carcinomas, 9 lesser-curve ulcers and 15 gastro-jejunal ulcers; 4 of the latter were not directly observed, but their presence was inferred from a localised area of severe nodular

TABLE V—GASTROSCOPY AFTER GASTRIC ANASTOMOSIS IN 99 CASES

	No. of cases		
After partial gastrectomy—			
Chronic ulcers	2		
Acute ulcers	4		
Gastritis	6		13
Failed	1		
After gastro-enterostomy—			
Gastro-jejunal lesions			
Chronic ulcers:			
Inspected	9	13	
Deduced	4		
Acute ulcers	2	25	
Scarring and stenosis of stoma	9		
Colic fistula	1		
Carcinoma	3		86
Lesser-curve ulcer	9		
Persistent hyperplastic gastritis (ulcer excluded)	33		
Incomplete examination:			
Failed to see stoma	7	16	
Partial view only	9		

gastritis at one part of the stomal ring which obscured the crater itself. Partial gastrectomy had been performed in 13 of them, and 6 of these had a jejunal or gastro-jejunal ulcer—figures which rebut the contention that recurrent ulceration does not follow this operation. One of the 6 was a Moynihan type of gastrectomy with gross stasis in the afferent loop, and 3 others had had insufficient resection of the stomach to produce material reduction in the amount of acid secretion. If partial gastrectomy is chosen for the treatment of peptic ulcer it must be sufficiently extensive to prevent recurrent ulceration.

Summary

The gastroscope introduces anatomical and pathological exactness into the study of dyspepsia. Its wider application may produce a substantial decrease in mortality from carcinoma of the stomach, and morbidity from gastritis and peptic ulceration.

I wish to thank Prof. Arthur Ellis and Sir James Walton for their help, Prof. F. R. Fraser for his advice, and the British Medical Association for their gift of a research grant during the later period of this investigation.

PULMONARY FAT-EMBOLISM

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(With Illustration on Plate)

PULMONARY fat-embolism is usually regarded as a somewhat uncommon complication of a fracture of a long bone, but a study of a series of deaths following accidents reveals that it is an almost constant finding and in many cases was probably a major factor in the fatal outcome. In severe injuries the importance of the various factors—shock, blood loss, visceral contusion and displacement—is difficult to assess. The frequency of fat-embolism as a morbid anatomical finding suggests that it is one of these factors, and should encourage its clinical recognition and treatment.

The literature on fat-embolism is extensive, though chiefly in the form of individual case-reports. Zenker in 1862 was the first to recognise the condition in man, although it had been produced experimentally by Lower in 1669 and Magendie in 1821 gave quite an accurate account of the symptoms and signs. The classical clinical account was written by Warthin (1913) and the most recent review is that of Grosskloss (1935).

Conditions which may induce fat-embolism range from a severe shaking without bony injuries to multiple and compound fractures; it is also to be found after severe burns and in certain cases of poisoning, particularly with alkalies (Fazekas 1938), and rarely after

manipulative operations and the therapeutic injection of oils.

After the accident there is an interval varying from a few hours to several days during which, apart from shock or major disability, the patient is comparatively well; after this a characteristic train of symptoms develops. He becomes extremely dyspnœic, pale, cyanotic, restless and sweating. He brings up frothy sputum, sometimes in large amounts, which collects round the lips and may be tinged with blood; but there is little coughing. He may complain of pain in the chest but his physical condition is usually so grave that he cannot state his subjective impressions. The pulse-rate, temperature, and respiration-rate are all raised but the blood-pressure does not fall. The superficial veins may be full, suggesting a rise in venous pressure; when, as sometimes happens, shock and fat-embolism are present together, the veins may not be turgid at first but become so as shock passes off under treatment. In the chest the percussion note may be somewhat impaired and basal râles may be present. Harris, Perrett, and MacLachlin (1939) have emphasised the sudden and profound anæmia found at this stage but I have made no detailed investigation of the point in this series, and in those cases in which the blood was examined no severe anæmia was found. If the patient survives this phase the dyspnœa diminishes, he may develop a cough with sputum—sometimes blood-stained, often purulent—and there will be signs of pulmonary consolidation; actual pneumonia may develop. Occasionally, either following on the dyspnœic phase or without it, the patient develops cerebral symptoms with stupor and irritability, more rarely fits or palsies and still less frequently generalised skin purpura.

The clinical picture of pulmonary fat-embolism may be mistaken for surgical shock or internal hæmorrhage; the cerebral symptoms may simulate cerebral contusion, and the purpura may be confused with the purpura of septicæmia. The diagnosis should be considered in all cases of injury developing pulmonary or cerebral symptoms. A characteristic feature is the "symptom-free interval"—a period varying from a few hours to two days during which the patient's condition apart from the injury is comparatively good. Symptoms developing after five days are unlikely to be due to fat-embolism. The following investigations may help to confirm the diagnosis.

Sputum.—Warthin (1913) first pointed out the value of sputum examination in suspected cases. The unfixed fresh sputum should be stained by adding a few drops of an alcohol-acetone solution of Sudan III. In a case of pulmonary fat-embolism free fat droplets will be present in addition to fat-containing alveolar phagocytes. It is unfortunate that in the early stages, when the diagnosis may still be in doubt, the patient seldom coughs up anything but œdema fluid, and the fat-containing sputum is not seen until the anoxæmic phase has passed. There is normally a considerable excretion of fat in the sputum, particularly in patients with chronic lung disease, but in such cases it is almost entirely enclosed in alveolar phagocytes in the form of very fine granules.

Urine.—Scriba (1880) described the occurrence of lipuria after injuries but there has been considerable disagreement as to its significance; recent writers such as Elting and Martin (1925) regard it as of diagnostic value, although it is not usually found until a week after the accident. It is naturally essential that the specimen be collected without the use of an oily lubricant.

Optic fundus.—Oppenheimer (1929) has observed fat globules in the retinal vessels in severe cases of fat-embolism, but it must be a rare phenomenon.

PATHOLOGY

In a fatal case it may be possible to find fat-emboli in all the organs of the body but the thoracic organs only will be considered in detail here. If death occurs during the first 48 hours after the injury the lungs have their most characteristic appearance. They are heavy and voluminous and feel firm but not solid and there is no difference in consistency between the apices and bases; there is no pleural effusion and the visceral pleural surface has a marbled appearance, zones of dark hæmorrhage alternating with areas of emphysema. The lungs cut with some resistance and discharge a frothy blood-stained fluid; globules of fat can often be seen on the surface; on squeezing, similar fluid exudes but it does not flow so readily as in cases of acute pulmonary œdema. The cut surface shows the same mottled appearance of emphysema, œdema and hæmorrhage as that seen on the external surface. The hæmorrhages are limited by the pulmonary septa and are not wedge-shaped. Nor is the congestion so extreme or the outline so precise as in cases of infarction. The bronchi contain frothy pink sputum and the branches of the pulmonary artery are dilated, containing liquid blood. The visceral pleura and pericardium may show scattered hæmorrhagic areas 3–5 mm. in diameter—the asphyxial hæmorrhages of Tardieu.

It may be useful here to mention the hæmorrhagic lesions found in lungs which have suffered direct trauma. In a rupture of the lung (which may occur in cases of severe violence without injury to the chest wall or diaphragm) there is an area of extreme hæmorrhage around the tear and the rest of the lung will show some collapse, especially if there has been any considerable hæmothorax. The bruise effects found may vary from hæmorrhagic bullæ on the visceral pleuræ (particularly on the posterior surface along the septal edges and often associated with hæmorrhages on the parietal pleural surfaces) to hæmorrhagic weals corresponding to the ribs and extending about 1 cm. into the lung substance; this in its most extreme form is characterised by extensive hæmorrhages into the lung substance and resembles the lesions produced in animals exposed to the effects of high explosives (Zuckerman 1940). Lastly, there is the condition of the lungs which may be called pulmonary concussion, found in patients subjected to propulsive violence; the changes appear analogous to those described in cases which have been exposed to the effect of high explosives (Falla 1940, Hadfield et al. 1940). The chest wall is intact and the surface of the lung may or may not show pleural hæmorrhages but these are entirely superficial. The cut surface of the lung shows widespread scattered areas of hæmorrhage from a few millimetres to several centimetres in diameter; most of the hæmorrhagic areas are not consolidated and the alveolar pattern is discernible by the naked eye, but in some zones there may be such hæmorrhagic consolidation as to resemble infarction; this is most marked in cases dying after several days when the blood has begun to organise. The hæmorrhagic areas have no predilection for any particular portion of the lung, and the rest of the lung tissue is congested and œdematous.

As yet I have only made an autopsy on one person who has died from a bomb explosion without gross injuries; considerable fat-embolism was present.

LEGENDS TO ILLUSTRATIONS ON PLATE

MR. HERMON TAYLOR

FIG. I—Early carcinoma. Nodular congested plaque on posterior wall.

FIG. II—Healing peptic ulcer. A, at first examination; B, after three weeks' medical treatment.

FIG. III—Impending hæmatemesis in chronic ulcer with acute erosion on its anterior margin.

FIG. IV—Mucosal types. A, normal; B, hypoplastic; C, hyperplastic.

FIG. V—Malignant ulceration. A, hyperplastic gastritis with ulcer on anterior wall of pyloric antrum; no good evidence of malignancy. B, after four weeks; signs of healing in proximal part of ulcer with suspicious mound of mucosa on further edge. C, after three weeks at convalescent home; little change; base of ulcer obscured by fine froth. D, six months after first examination; undoubted malignant change

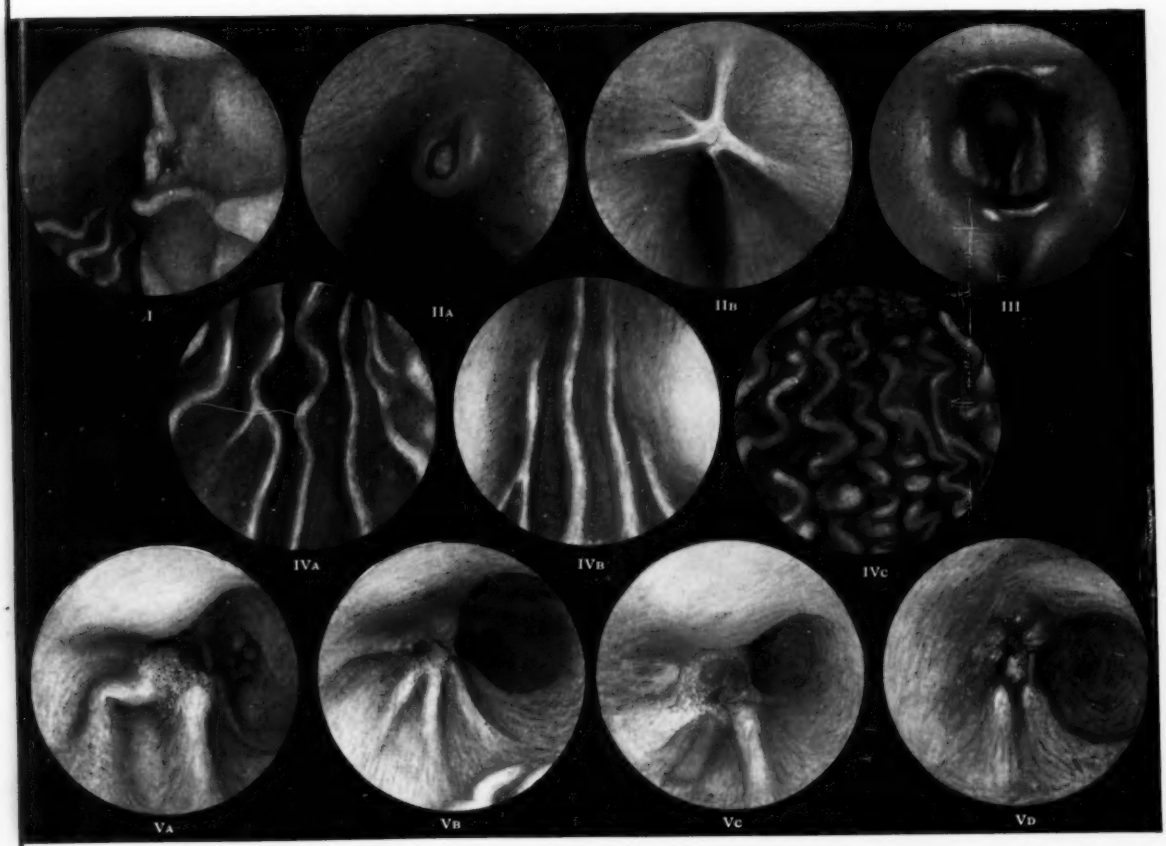
MR. LE VAY

FIG. I—Barium enema showing spasm and narrowing over a short length of sigmoid colon, with loss of haustration and a deformity possibly the result of diverticulum formation.

DR. ROBB-SMITH

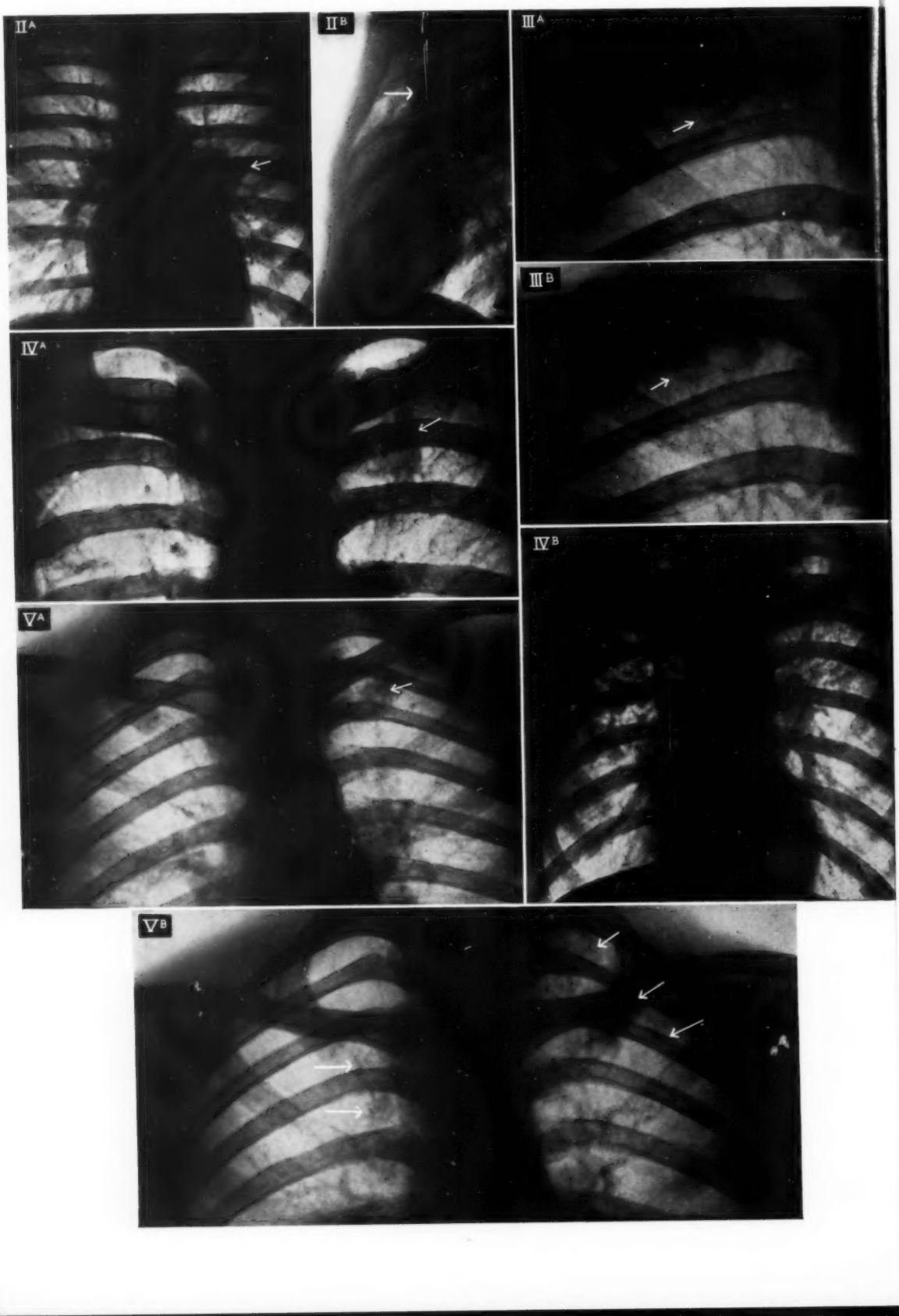
FIG. IV—Pulmonary fat-embolism (gunshot wound of groin). Pulmonary artery laid open, showing pools of fat in right and left branches.

MR. HERMON TAYLOR: PRACTICAL EVALUATION OF GASTROSCOPY



MR. LE VAY: TORSION OF APPENDICES EPIPLOICÆ

DR. ROBB-SMITH: PULMONARY FAT-EMBOLISM


II A
II B
III A
III B
IV A
IV B
V A
V B

In the later stages of fat-embolism (5–9 days), when the patient has shown definite pneumonic symptoms, the lungs are heavy but not so firm as in the earlier stages, nor are the hæmorrhagic zones so obvious, although there may be localised areas of organising blood. The cut surface discharges a frothy greasy fluid and the whole lung is extremely œdematous with areas of slight consolidation but no emphysema. There is no excess of pericardial fluid but the right side of the heart is invariably dilated; epicardial asphyxial hæmorrhages may be found but the "shock hæmorrhages" on the wall of the left ventricle (Sheehan 1940) are only found in cases associated with shock. If blood is collected from the right and left ventricles and centrifuged, it will be found that there is a considerable surface layer of fat in the venous blood but a much smaller amount in the arterial blood. The cerebral lesions are characterised by œdema with petechial hæmorrhages in the white matter and sometimes areas of softening (Neubürger 1925); hæmorrhagic lesions may be found in the skin, heart-muscle, and gastro-intestinal tract in cases in which the emboli have passed through the lungs to the systemic circulation.

The post-mortem diagnosis of pulmonary fat-embolism is most readily confirmed by the examination of a fresh preparation (Robb-Smith 1938); snippets of lung are placed on a slide and a few drops of 2% potassium hydroxide are added and a coverslip applied. After a few minutes the tissue will be cleared and the red cells lysed; on examining the preparation with the 16 mm. lens, with the iris diaphragm partially closed, the fat will be seen lying in the alveolar capillaries, as cylinders or in a racemose formation. The fat-emboli are refractile and show a narrow dark edge whereas air bubbles are round, more highly refractile and have a broad dark rim (fig. I). In patients dying in the late pneumonic stage very little fat may be found in the capillaries but much in the alveoli, and it may then be difficult to distinguish this appearance from that found in inhalation pneumonia, though in the latter condition fat is never found within capillaries.

The examination of fixed tissue shows capillary congestion, with intra-alveolar hæmorrhages, and œdema alternating with zones of emphysema (fig. II). In the early stages there is no cellular reaction but in the later phase there is a moderate focal neutrophil reaction and many of the œdematous alveoli contain large numbers of alveolar phagocytes and fibrin; this may develop into a lobular catarrhal pneumonia and in the hæmorrhagic zones there may be organisation of the blood-clot. In paraffin sections the breaks in continuity of the columns of erythrocytes in vessels may be noted, but frozen sections stained for fat reveal the branching emboli of fat (fig. III) and in the later stages fat, both free and in alveolar phagocytes, in the alveolar lumina. In a number of cases dying shortly after a severe injury the lungs showed none of the gross appearances already described, yet microscopic examination revealed massive fat-emboli; it is probable that in these cases the circulation ceased before the tissue changes induced by the emboli developed. In a case which died suddenly large masses of fat were lodged in the pulmonary artery and it seemed probable that death was due to pulmonary embolism in which the fat occluded the artery in a similar manner to a thrombus dislodged from a vein (fig. IV on plate).

LEGENDS TO ILLUSTRATIONS ON PLATE

DR. KAYNE

FIG. IIA—Posteroanterior radiogram in case 1. Normal lung fields except for enlargement of left hilar shadow.

FIG. IIB—Same patient. Left lateral radiogram; oval shadow in upper lobe, situated in front and partly above the hilar shadow, thus causing apparent enlargement of hilar shadow itself on posteroanterior film (see fig. IIA).

FIG. IIIA—Upper zone of right lung field in a young adult contact. Small circular shadow in angle between posterior part of third rib and clavicle largely hidden by shadow of anterior part of first rib.

FIG. IIIB—Same patient. Part of another radiogram with position of patient slightly altered; the focus is now clearly visible in the anterior first interspace.

FIG. IVA—Upper section of radiogram in case 2. Small oval shadow close to tip of left first rib, extending below the level of the lower border of the rib; prominent "lung markings" pass from the focus to the upper pole of the hilar shadow.

FIG. IVB—Same patient, nine months later. Extensive fluffy shadows in upper and mid zones of each lung field, more marked on the right.

FIG. VA—Upper section of radiogram in case 3. Faint, small, roundish shadow close to tip of left first rib.

FIG. VB—Same patient, twenty months later. There are now several fluffy shadows in the inner part of the left upper zone extending from the apex to the hilum, and also in the outer part of the first interspace; also mottling in the area between the tip of the right first rib and the mediastinum.

PATHOGENESIS

The essential factor in fat-embolism is that there is fat in the circulating blood, not in the fine emulsion of a metabolic lipæmia but in globules large enough to obstruct the finer capillaries and induce local anoxæmia. In the lung the secondary changes associated with this may be of such magnitude as to obstruct the pulmonary circulation. In addition, the fat or its breakdown products may possibly exert a direct toxic action on the tissues, though there is only somewhat equivocal experimental work to support this hypothesis. Whether the fat is entirely derived from released tissue-fat entering the circulation from the traumatised area, or whether as a result of the trauma there is a change in the physico-chemical state of the normal blood fats with a loss of emulsification, cannot be discussed at length here; the first view will explain the majority of cases. However, recent work by Macfarlane, Oakley and Anderson (1941) has shown that *Clostridium welchii* produces a powerful lipo-proteolytic agent which splits the lipo-protein complexes of blood, and it is conceivable that traumatised tissues also release a lipo-proteinase. It is not known for certain whether death in fat-embolism is caused by a general anoxæmia owing to the interference with respiratory function, local anæmia of a vital centre due to a fat-embolus, cardiac failure due to physical pulmonary obstruction, or a neurocardiac mechanism. Elucidation of this problem is essential if rational therapeutic measures are to be adopted.

THERAPEUSIS

In the prevention of fat-embolism the most important measure is early immobilisation of the injured region with a minimum of manipulation; it is doubtful if aspiration of the fluid which collects in the region of fracture is of much value and ligation of the main veins draining the traumatised area is hardly practicable, although sound in theory.

When symptoms of pulmonary fat-embolism have developed treatment must be directed first to relieving the anoxæmia and cardiac embarrassment and secondly to disposing of the fat so that it does not spread to the systemic circulation. Cyanosis may be relieved by oxygen, given by a B.L.B. mask affording a concentration of over 80% of oxygen in the alveolar air; or in the presence of facial injuries by a tent, giving an alveolar concentration of 50–60%. If other injuries permit, the patient should be propped up. It is doubtful if atropine would prove of much value because the œdema is due to transudation of capillary fluid into the alveoli rather than to an excessive secretion of fluid; it is also questionable whether stimulants of the Coramine type are of real value. Morphia is inexpedient owing to its respiratory depressant action; the barbiturates are probably the least harmful of the effective analgesics. A difficult problem arises with regard to intravenous infusions; the pulmonary circulation is impeded by the vascular changes in the lung and fatal cases show a considerable right-sided cardiac dilatation, although gross venous engorgement is not observed. It seems unwise to load the right side of the heart by further increasing the venous volume—in fact venesection might appear to be rational and has been suggested. On the other hand, many cases of pulmonary fat-embolism have suffered considerable blood-loss and are shocked—conditions clearly demanding infusions of blood or plasma. This dilemma may be overcome by treating

the shock or hæmorrhage by immediate venous infusion, so that if there is fat-embolism the fluid has been given before the pulmonary symptoms develop; but when these symptoms are present further infusions should not be given in the mistaken idea that further hæmorrhage or shock has developed. Saline infusions should not be used since the danger of increasing the pulmonary œdema is very real. As a general rule intravenous infusions should be withheld if the veins are engorged.

Therapeutic measures have been suggested with the intention either of preventing the fat passing through the lungs into the systemic circulation or of converting it into a state in which it will be harmless. With the first object Killian (1931) has claimed that adrenaline or kindred substances is of value but he has not received support from other clinicians. The problem of converting the fat into a harmless state has been approached in various ways. It has been recommended that prolonged ether anæsthesia should be administered, and in animals examined during the period of anæsthesia there is certainly less fat in the lungs; but after all the ether has been exhaled the amount of fat-embolism both in the lungs and other viscera is greater than in traumatised animals which have not been anæsthetised. Wegelin (1923) advocated the intravenous infusion of a 2% solution of sodium carbonate to saponify the fat but this is not sound theoretically, and although in practice the dyspnœa and pyrexia are diminished the clinical course is not altered. Recently Rappert (1939) has suggested that sodium desoxycholate should be administered intravenously in order to emulsify the fat and reduce the raised blood-viscosity; on general principles this seems reasonable and in the few cases reported the results appeared beneficial. He recommends that 10 c.cm. of 20% solution be given very slowly in a drip infusion every 2 hours; it is liable to cause nausea and vomiting if given rapidly. A single injection of 10 c.cm. was given in one case; the patient's pulmonary condition improved rapidly but he developed cerebral fat-embolism from which he died. An experimental investigation has been started to try and assess the real value of this form of treatment.

In patients who have developed a true pneumonia as a late complication, the usual treatment for a hypostatic pneumonia should be given. The restlessness and

TABLE I—INCIDENCE OF FAT-EMBOLISM, ENDOCARDIAL HÆMORRHAGES AND PULMONARY CONCUSSION IN 115 FATAL ACCIDENTS *

Bony Injuries	No. of cases	No fat-embolism	Gross fat-embolism	Fat-embolism major fatal factor	Subendocardial hæmorrhage	Pulmonary concussion
No bony injury ..	12	4	5	6	2	1
Fractured skull bone	33	10	6	2	3	5
Other fractures ..	70	8	30	21	12	14
Total	115	22	41	29	17	20

* Lack of space makes it impossible to give details of these cases.

TABLE II—DETAILS OF 29 CASES IN WHICH FAT-EMBOLISM WAS REGARDED AS A MAJOR FATAL FACTOR

Age	Sex	Nature of accident	Injuries	Survival	Ratio of lung weight to the normal	Subendocardial hæmorrhage	Notes *
			CASES WITHOUT BONY INJURY (12)				
77	M	Struck by car	Slight abrasions; cerebral bruising	6 days	1·80	±	Commencing pneumonia consolidation.
22	F	,, ,,	Superficial abrasions; subarachnoid hæmorrhage	15 hr.	2·04	+	Evidence of shock and pulmonary concussion.
25	M	Fell from a roundabout	Subarachnoid hæmorrhage and slight cerebral bruising	3 days	2·10	–	
13	M	Fell from a tree	Subarachnoid hæmorrhage	7 hr.	2·47	–	
20	M	Shooting accident	Laceration of leg muscles; amputation	27 hr.	2·43	–	
25	M	Gunshot wound	Tear of femoral vein	2½ hr.	0·7	–	Pulmonary embolism formed of fat.
			CASES WITH FRACTURE OF SKULL (33)				
19	M	Motor-cycle accident	Fracture of middle fossa; slight cerebral bruising	6 hr.	2·18	–	
14	M	Motor-car accident	,, ,,	8 hr.	1·59	–	Slight pulmonary concussion.
			CASES WITH OTHER FRACTURES (70)				
27	M	Motor-cycle accident	Fractured skull and femur; very slight cerebral contusion	27 hr.	not weighed	–	
25	M	Motor-car accident	Fractured radius, bruising of abdominal muscles	6 hr.	1·5	–	Superficial pulmonary bruising.
18	M	Motor-cycle accident	Colles' fracture and fracture of skull, slight cerebral contusion	12 hr.	1·48	–	Slight pulmonary concussion.
24	M	,, ,,	Fractured skull, tibia and fibula; slight cerebral contusion	28 hr.	1·63	–	
14	M	Crushing injury	Pott's fracture; fractured sternum and clavicle	24 hr.	2·85	–	Pulmonary concussion.
35	M	Motor-car accident	Fractured skull and rib; slight cerebral contusion	3 hr.	1·67	–	Evidence of shock as well.
40	M	Fell 40 ft.	Fractured femur and pelvis	23 hr.	2·41	–	
27	M	Motor-car accident	Fractured jaw; superficial injuries	10 hr.	2·1	+	Evidence of shock as well.
35	M	,, ,,	Fractured rib, clavicle and fibula; slight cerebral bruising	3 days	1·1	–	Collapsed left lung with traumatic pneumthorax.
49	M	,, ,,	Fractured jaw and rib	29 hr.	1·45	–	
23	M	,, ,,	Fractured femur; slight subarachnoid hæmorrhage	4 days	2·05	–	With cerebral fat-embolism as well.
70	F	,, ,,	Fractured femur	29 hr.	1·61	–	
60	M	,, ,,	Fractured ribs, clavicle and skull; very slight subarachnoid hæmorrhage	4 days	2·10	–	Pneumonic stage of fat-embolism.
58	F	,, ,,	Fractured tibia, fibula and humerus	24 hr.	1·78	–	
59	M	,, ,,	Fractured rib, tibia, humerus and clavicle	7 hr.	1·87	–	Pulmonary concussion as well.
69	M	Knocked down in street	Fractured transverse process of 4 and 5 lumbar vertebræ; bruising	9 hr.	1·82	–	
26	M	Motor-car accident	Fractured tibia and fibula	2½ days	1·51	+	Cerebral fat-embolism as well.
22	M	Struck by lorry	Fractured skull; Pott's fracture; lacerated muscles	3 days	1·67	–	Pulmonary concussion with cerebral fat-embolism.
67	M	Motor-car accident	Compound fracture radius and ulna; slight subarachoid hæmorrhage	9 days	1·55	–	Late stage with pneumonic consolidation.
26	M	,, ,,	Fractured femur and pelvis	7 days	2·05	–	Slight pulmonary bruising as well as pulmonary and cerebral fat-embolism
32	M	Air-raid casualty	Fractured rib; puncture of kidney	16 hr.	1·34	+	Pulmonary laceration and concussion.

* Where no comment is made the pulmonary appearances were typical of fat-embolism.

irritability of cerebral fat-embolism may be combated by depressants such as phenobarbitone, and repeated lumbar puncture has been recommended, though there is no rise in intracranial pressure.

CLINICAL MATERIAL

This paper is based on a consecutive series of 789 accident cases admitted to the Radcliffe Infirmary, Oxford, over a period of three years; of these 125 died but 10 have been omitted from the analysis either because post-mortem examination was not carried out or death occurred more than three weeks after the accident. It is not within the province of this report to consider how many of the recovered cases showed clinical evidence of fat-embolism, although information on this point is much needed. There is little doubt that many of the complications of injuries—such as traumatic pneumonia or delirium, delayed shock, and possibly certain cases of "blast"—are in reality examples of fat-embolism. The cases have been divided into those without bony injury, those with a fracture of skull alone, and those with general bony injury (table I). For the cases where fat-embolism was considered the major fatal factor (table II) the ratio of the weight of the two lungs to the normal for the patient's age (Rössle 1932) is given; provided there is no pneumonic or gross hæmorrhagic consolidation this gives some impression of the degree of congestion and œdema. The degree of fat-embolism found microscopically has been graded arbitrarily; − infers that no fat emboli were found or at the most one or two emboli in about a 5 sq. cm. lung section; ± infers emboli to be found every 1 sq. cm.; + emboli every 30 sq. mm., and ++ several emboli in 1 sq. mm. (the last two areas are the approximate fields of 24 and 16 mm. objectives used with a × 7 eyepiece).

The lungs have been examined for fat-emboli in a large series of non-traumatic deaths, and except in cases of burns, where very slight signs of fat-embolism have been found, the results have been negative.

There is no adequate account of the morphological changes due to shock in human cases, although the changes in animals are well known (Moon 1938). This is probably due to the wise caution of morbid anatomists who recognise the gross changes that may occur between death and the autopsy. However, Sheehan (1940) has emphasised the significance of subendocardial hæmorrhage in the posterior wall of the left ventricle, and this observation has been fully confirmed in this series. In addition, in some cases a highly characteristic œdema of loose connective tissue has been observed strictly analogous to that in shocked animals, and where this œdema was observed Sheehan's sign was almost always present.

Of the 12 cases without bony injury 5 showed gross pulmonary fat-embolism and in 6 it was regarded as a significant factor in the fatal outcome. In the 33 cases with a skull fracture only 6 showed gross embolism and in 10 no fat-embolism was found. In only 2 of these cases was the fat-embolism believed to be important, as the majority had suffered severe cerebral injury. Of the third group of 70 cases, 8 showed no fat-emboli, in 30 it was very marked, and in 21 regarded as the major factor in death. Thus of the 115 cases fat-emboli were not found in 22 (19%), were severe in 41 (35%), and regarded as a major factor in 29 (25%).

CASE-HISTORIES

CASE 1.—A man aged 26 sustained a fracture of the upper third of the left femur in a motor accident; when admitted to the ward two hours after the accident he had been vomiting brownish fluid and was profoundly shocked (blood-pressure 86/36, temperature 99°, respiration-rate 30). He was given oxygen and 2 pints of plasma and radiant heat was applied. He improved considerably and six hours after the accident his blood-pressure was 105/75. Half an hour later he began to complain of pains and cramps all over, especially in the chest and groins; he was restless, cyanosed and sweating (B.P. 120/75, pulse-rate 50). Oxygen was given through a B.L.B. mask, and although the cyanosis disappeared his general condition did not improve; by twelve hours after the accident his respiration-rate had risen to 44 and there were crepitations and moist sounds in the chest. A diagnosis of pulmonary fat-embolism was made and it was decided to try the effect of sodium desoxycholate. A saline infusion of one pint containing 10 c.cm. of 20% decholin was given over an hour and a half. At the end of the infusion the respiration-rate had dropped to 28 and his general condition had improved. The day after the accident his general condition was satisfactory (B.P. 130/60, respirations 28, pulse 120). The leg was set up in extension with a tibial pin. Next day he began to cough up blood-stained sputum and the respirations varied between 25 and 32. He became mentally confused, stupor alternating with violent irritability; there was no evidence of increased intracranial pressure. Nembutal relieved his restlessness but his general condition steadily deteriorated with rising temperature, pulse- and respiration-rate, and signs of consolidation in the lungs. He died six days after the accident. At autopsy I found a fracture of the femur with much laceration of the muscles, a fracture of the pubis without displacement or urethral injury, slight tearing and bruising of the right lung, gross fat-embolism in the pneumonic stage in the lung and severe cerebral fat-embolism.

This is a typical case of fat-embolism showing the various stages—shock, symptom-free interval, anoxæmia, pneumonia and embolism in the systemic circulation. Although his condition improved temporarily after sodium desoxycholate, this did not alter the outcome.

CASE 2.—A man aged 25 had a bullet wound in the right thigh from which there had been profuse hæmorrhage. On admission he was shocked and restless so that the blood-pressure could not be determined. He was given 3 pints of blood with considerable improvement, but an hour after the accident he became unconscious and died suddenly an hour and a half later. At the autopsy the bullet and fragments of metal were found to have taken a course from the great trochanter, anterior to the hip-joint, tearing the femoral vein and becoming embedded in the loose tissues of the pubis.

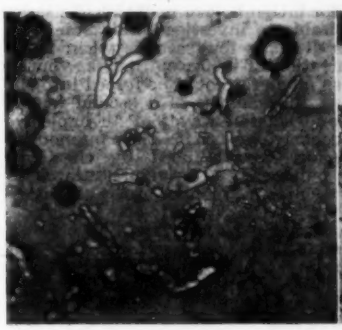


FIG. I—Pulmonary fat-embolism. Fresh preparation of lung cleared with 2% potassium hydroxide (× 60).

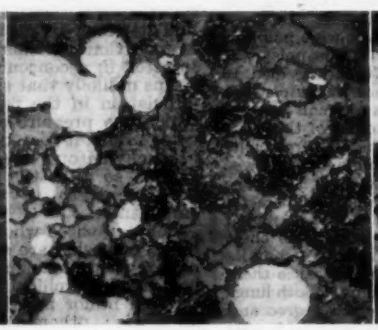


FIG. II—Pulmonary fat-embolism. Showing zones of emphysema, œdema, and interalveolar hæmorrhage. H. and E. (× 60).

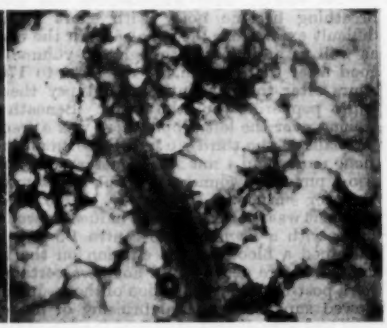


FIG. III—Pulmonary fat-embolism. Frozen section showing emboli, congestion, and emphysema. Osmic acid (× 20).

The lungs were oxygenated and slightly emphysematous and the right heart was greatly dilated; lying in the pulmonary artery and to a large extent occluding the right and left branches was about 3 c.cm. of semi-liquid fat, and the main branches of the pulmonary artery contained fat but very little blood (fig. IV on plate). Histological examination of the lung showed only a moderate amount of capillary fat-embolism.

This appears to be a case of pulmonary embolism in which the occluding embolus was formed of fat rather than blood-clot.

CASE 3.—A man aged 32 was in a room of a single-storied house when it was struck by a bomb. He was admitted severely shocked with only superficial injuries. Pulse-rate 110, poor volume. He had great inspiratory difficulty and the chest was hyper-resonant. He was given two pints of plasma slowly, after which there was some vomiting, his breathing became noisy with short inspiration and long difficult expirations; coarse râles in the chest were palpable as well as audible. Although the volume of the pulse was good after the infusion, its rate rose to 170 and he died 16 hours after the incident. At autopsy there was superficial "dirt peppering" of the body. Beneath a small area of grazing over the left nipple there was a fracture of the outer corticalis of the third rib and three small metallic fragments (none more than 4 mm. in diameter) were found. There was also a puncture wound of the left loin whose track led to the posterior surface of the kidney, where another small metal fragment was lying; this had induced a wedge-shaped area of pallor with a hæmorrhagic centre 1·3 cm. long. The chest contained a blood-stained effusion on the right side but its amount before death could not be ascertained because there was a post-mortem perforation of the œsophagus. Both lungs showed superficial pleural bruising of moderate degree and there was a small area of pleural tearing of the anterior border of the right upper lobe with a zone of consolidated interstitial hæmorrhage, 5 × 4 × 6 cm., deep to this. Apart from these lacerated injuries both lungs were congested and œdematous, with scattered areas of hæmorrhage for the most part without consolidation, and this was more noticeable on the right than on the left. There were endocardial hæmorrhages on the wall of the left ventricle. Sections of the lung showed a severe degree of fat-embolism and the areas of maximum naked-eye hæmorrhage corresponded with the foci of fat-emboli (fig. III).

The actual lacerations in this case were trivial; the clinical evidence suggested that the immediate shock had been combated and the cause of death was a combination of pulmonary fat-embolism and intrapulmonary concussion.

DISCUSSION

These cases have demonstrated the reality and possibility of diagnosing a condition usually regarded as chimerical. As to whether the clinical conditions which follow injuries are due to shock or fat-embolism (Moon 1938) it must be clear that both conditions may occur and are distinct, although they can show superficial resemblances and possibly have pathogenetic relationships; but to suggest that the symptoms usually attributed to shock are really due to fat-embolism would be as absurd as to state that symptoms attributed to "delayed shock" are never due to fat-embolism. The possibility of fat-embolism occurring in cases of severe concussion (Ribbert's *Erschütterung*) has been recognised for seventy years, yet as far as I know it has never been considered as a factor in the clinical conditions following explosions.

It would be well to abandon the term "blast injuries" in favour of concussion; the former term suggests some new pathological process terrible in its nature and difficult to treat, whereas pulmonary concussion gives an idea of the pathogenesis and therefore of the rationale of treatment irrespective of the physical agent inducing it. It may be objected that the term concussion by reason of its cerebral association has come to mean a shaking without interstitial hæmorrhage; but this is a specialised meaning and the changes in the lung, whether due to the pressure wave of a high-explosive bomb or the impact of a man thrown from a motor-bicycle, are concussive in nature, and similar clinically and skiagraphically. The term pulmonary contusion does not seem so acceptable because it implies a bruising in relation to the surface of the viscus rather than a change throughout its substance.

The injuries due to a bomb explosion may be divided into those which are rapidly fatal and those which are not. In the first group there may be gross traumata and death be attributed to disruption of the organs and shock, or there may be no external injuries. Our knowledge of the morphological lesions in this group is ridiculously small though it is to be hoped that modification of the regulations may facilitate a study of these cases. In Hadfield's (1940) series of 10 cases all showed interstitial pulmonary hæmorrhages of the concussive type but little of the pleural contusions observed in Zuckerman's animals. The finding of a high degree of carboxyhæmoglobinæmia in 3 cases is important, but it is unlikely to be a universal factor, for cases have been described (without autopsy) in which death occurred suddenly when a bomb exploded in open country rather than a closed space. Moreover, even in the high concentration of an asphyxial chamber carbon monoxide takes several minutes to cause death. There is no mention of a search for fat-embolism in Hadfield's series and it would be desirable to investigate this point; it is true that animals die in a few seconds when fat is injected in a concentration of 0·75 c.cm. per kg. but it seems unlikely that so much fat could be forced into the circulation in the few thousandths of a second during which the pressure and suction waves of an explosive acts. But it is conceivable that the pulmonary parenchymatous hæmorrhages induced by the concussion so alter the pulmonary arterial pressure as to produce death in a similar manner to pulmonary embolism.

Some of those who survive the immediate effects of a bomb explosion are none the worse save for a feeling of having been "shaken up"; how much this is physical, how much psychical it is difficult to say. Others have suffered minor injuries from flying fragments of bomb or debris; others have suffered major injuries from a similar cause; and lastly there are those with or without major injuries who develop pulmonary symptoms which may or may not prove fatal. It is this last group which has aroused particular interest and cases have been reported in Zuckerman's paper and by Alison and his colleagues (1940). Post-mortem accounts are scanty, but there is no doubt that the lesions described here as "pulmonary concussion" are the characteristic finding. Only in case 3 in this paper is there a record of fat-embolism being looked for, and it was found in such amounts as to be regarded as a considerable factor in the fatal outcome. Of 3 other fatal air-raid casualties in which there were gross visceral and limb injuries, fat-embolism was found in only one and was slight, but none of these patients had symptoms suggestive of pulmonary concussion or fat-embolism. The pulmonary symptoms in the published cases and in case 3 came on soon after the explosion—the course of events seen in pulmonary concussion from ordinary peace-time accidents, and unusual in any but the most severe cases of fat-embolism, a symptom-free interval being more common. I suggest that the pulmonary symptoms in bombed cases may be a combination of pulmonary concussion and fat-embolism, and I hope that pathologists doing autopsies on them will keep this possibility in mind. Should it prove true it may modify treatment, for although the general procedure in pulmonary concussion and fat-embolism is essentially similar the effects of fat-embolism are progressive, and if a satisfactory form of specific therapy were found, it would much improve the outlook.

SUMMARY

Symptoms of pulmonary fat-embolism arising from injuries come on after a symptom-free interval varying from a few hours to several days. The patient becomes dyspnœic, pale, cyanosed and restless, and, with little coughing, brings up frothy sputum which may be blood-stained. Fat-emboli in the systemic circulation may produce purpura, or cerebral symptoms such as stupor, fits or palsies. The blood-pressure does not fall.

Early immobilisation of injured parts is the most important prophylactic measure. In treatment anoxæmia should be relieved with oxygen given by a B.L.B. mask; morphia should be avoided. Adrenaline and sodium desoxycholate by injection and ether inhalations have been tried without success. Transfusions of blood or plasma should be withheld when symptoms of fat-embolism have developed.

At autopsy the diagnosis can be established by examination of fresh snippets of lung cleared with

potassium hydroxide; fat in the alveolar capillaries is seen as refractile clusters or cylinders with a narrow dark edge.

Of 789 consecutive accident cases 125 died; of these 41 had gross pulmonary fat-embolism, and in 29 it was thought to have played a major part in causing death. Of the fatal cases 12 had no bony injury, but 6 of these appeared to have died from fat-embolism, including 1 air-raid casualty.

The pulmonary symptoms which arise from exposure to the blast of high explosive may be due to a combination of pulmonary concussion (a preferable term to blast injury or pulmonary contusion) and fat-embolism, and fat-emboli should be specifically looked for in autopsies on air-raid casualties. If their frequency is confirmed the treatment of such cases may have to be revised.

I should like to thank the medical and surgical staff of the Radcliffe Infirmary and Mr. H. F. Galpin, H.M. coroner for Oxford, for permission to publish this paper; Dr. Douglas Black and Prof. S. Zuckerman for their advice; and my technicians, Mr. Reginald Duffett, Mr. Cecil Rowe, and Mr. Kenneth White for preparing the material on which this paper is based.

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TORSION AND INFLAMMATION OF THE APPENDICES EPIPLOICÆ

BY A. DAVID LE VAY, M.B. Lond., F.R.C.S.
SURGEON E.M.S.

(With Illustration on Plate)

DISEASED appendices epiploicæ probably give rise to abdominal symptoms and are found at operation for other conditions more often than one would suppose from the recorded cases. Pathologists are particularly likely to find evidence of such disease; thus Virchow many years ago reported the discovery of what he termed "corpora aliena adiposa" lying free in the peritoneal cavity, the result of spontaneous separation.

CASE-RECORD

A married woman of 45 was admitted to hospital with 15 months' history of pain in the left iliac fossa and hypogastrium. The pain was gnawing and constant and occasionally made worse by food; though troublesome at times it had never taken the form of an acute attack. In addition to this well-localised pain there was diffuse soreness in the epigastrium. Nausea and vomiting were absent, bowel-action regular, and the stools normal except for one attack of blood-stained diarrhœa 9 months after the onset. Moderate loss of weight had occurred, associated with some anorexia. She was pale and languid, with some wasting. The abdomen was lax with considerable tenderness in the left iliac fossa, where the sigmoid colon was palpable and extremely tender over a limited extent. No mass could be felt, rectal examination was negative, and there was no clinical evidence of a malignant abdominal condition. Occult blood was never found in the stools. A barium enema showed spasm and narrowing over 2–3 in. of the sigmoid colon with loss of haustration and a deformity at one point rather suggestive of a diverticulum (fig. I on plate). Blood-count was within normal limits. The case was regarded clinically as one of chronic diverticulitis, but in view of the wasting operation was decided on.

At laparotomy no abnormality was found until the wound was about to be closed, when a purplish-black mass the size of a cherry, hidden by adherent appendices epiploicæ, was found on the anterior surface of the sigmoid. This mass was seen to be a deeply congested appendage with twisted pedicle, and the adjacent mesocolon was thickened and granular; after ligation of the pedicle the little tumour was removed. Convalescence was uneventful and after 6 months the patient is still quite free from pain.

On section, the tumour showed numerous areas of recent hæmorrhage intermingled with areas of older hæmorrhage and fibrosis. There was no trace of the small central vessels (figs. II and III).

DISCUSSION

The appendices epiploicæ are arranged in an anterior and a postero-medial row along the line of the large intestine, though sometimes only one row is present and occasionally there are three. They begin to appear in the fifth month of fœta life as localised subserous fatty collections which develop along the descending and sigmoid colon before the rest of the bowel. A small artery and vein, derived from the vasa recta of the colic vessels encircling the bowel, supply each appendix. No particular function can be assigned them; buffering of the colon and the regulation of water-absorption have been suggested. Their pathological affections may be mechanical (torsion and its sequelæ) or inflammatory, and either of these may be acute or chronic. Acute torsion is the commonest condition and gives rise by vascular disturbance to subserous hæmorrhage, necrosis or even gangrene, the artery and vein being commonly thrombosed. After one or more attacks the appendix may become detached as a free fibro-fatty body lying close to its original site, or, more often, in the pelvis (Micheli 1938, Walser 1939); it may become calcified and radio-opaque. Recurrent or subacute torsion may occur and rarely the condition is chronic throughout, as in the case described here. There appears to be a definite association with torsion of other viscera, particularly the omentum (Smoler 1907, Davis 1939) and the vermiform appendix (Colt 1932). Two appendices may undergo simultaneous torsion.

Inflammation is much less common; thus Fiske (1936) reviewing 44 cases found that only 4 were not cases of torsion. Adding the cases reported since, including mine, out of a total of 60 there are only 6 in which torsion was absent. Fiske suggests that the appendices may become secondarily infected from a diverticulitis or from the vermiform appendix, and this seems a reasonable explanation of the onset of inflammatory change in the untwisted organ. In a few cases vascular changes have been so marked in the absence of signs of torsion or inflammation as to have been described as apoplexy of the appendices (Campbell 1938, Randall 1932). These are probably instances of infarction.

Abscess formation or even general peritonitis may result from inflammation or torsion, and may give rise to bands leading later to obstruction. Baumeister, Jargens and Morsman (1938) collected 6 cases of obstruction and showed the common cause to be the adhesion of a pair of appendices across the antimesenteric surface of the bowel, causing narrowing of the lumen; in one of their cases this had taken place at two different levels in the sigmoid of the same patient. Extensive adhesions to adjacent viscera may form, especially to the female pelvic viscera, which in one case were densely matted together around a small abscess-cavity enclosing a detached appendage (Walser 1939). Fiske found 26 of his 44 cases in the sigmoid, 9 in the cæcum, 4 in the ascending colon, 2 in the transverse and 1 in the descending colon. Herniæ of the epiploic appendices are occasionally found, usually on the left side in elderly males, in association with a low mobile sigmoid. The appendices are often adherent distally to the sac wall and may be elongated into fibrous cords as the sac increases in size. The pedicle may separate, giving rise to a loose body in the sac, and the appendices may, of course, undergo torsion or become inflamed. If the hernia strangulates it gives rise to local

and abdominal pain without much general disturbance; if torsion of an epiploic appendix occurs, strangulation of the hernia is usually precipitated by the increase in volume of the sac contents. The symptoms are then similar to those of primary strangulation, but there are often mild preceding attacks due, presumably, to abortive attempts at torsion on the part of the guilty appendix. The incarceration of an appendix in a hernia may so angulate the sigmoid at the mouth of the sac as to give rise to actual obstruction (Uggieri 1940). There are 12 recorded cases of epiploic hernia, which include 3 instances of torsion and 6 of strangulation; where both changes had occurred the primary lesion was difficult to settle (Uggieri 1940, Patel and Mallet-Guy 1923, Oudard and Coureaud 1929). An appendix may, of course, contain a diverticulum, but this condition and its implications belong to the pathology of diverticulitis.

CLINICAL ASPECTS

Outstanding symptoms are not necessarily produced in every case of disease of the appendices epiploicæ. Thus 5 of Fiske's 44 cases were found unexpectedly at autopsy or during operation for some other condition. Of the 60 recorded cases, 46 gave rise to acute abdominal symptoms, 9 were chronic or subacute and 5 were asymptomatic. Pain was the only constant complaint, being acute, recurrent and subacute, or chronic. It sometimes followed severe exertion, was nearly always in the lower abdomen, and occurred on either side of the midline with equal frequency; in a few cases pain was epigastric. Nausea and vomiting were symptoms in less than a fifth of the total. Local tenderness was a prominent sign in over half, but the discovery of a palpable tumour was rare.

As Walser (1939) points out, only a tentative diagnosis is possible in the acute case, if the condition is ever even considered. I find only one case reported in which the preoperative diagnosis was made with certainty (Fiske 1936) and in that a small mass was present in the left iliac fossa. The diagnosis is usually acute (vermicular) appendicitis and operation the treatment, no harm results provided the true state of affairs is recognised and the offending epiploic appendix is removed. As the present case showed, however, it may not be easy to

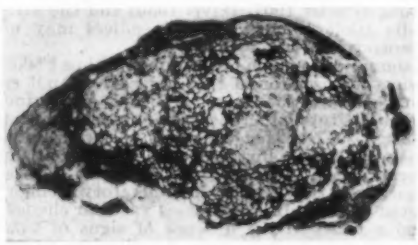

FIG. II—Section of twisted epiploic appendix, low power (× 8). Scattered areas of subserous and interstitial hæmorrhage with no trace of the central vessels.

detect the small mass hidden among the adherent normal appendices of a fat-laden colon. Other misdiagnoses are those of acute diverticulitis, acute salpingitis, twisted ovarian cyst and acute cholecystitis. A study of the 9 chronic cases does, however, suggest that pain in the left iliac fossa as an isolated symptom in a well-nourished middle-aged person should call the condition to mind. While in such a case the diagnosis, sigmoidoscopic appearances apart, will usually lie between carcinoma and diverticulitis of the sigmoid, the complete absence of bowel symptoms together with a barium enema showing spasm but no positive evidence of diverticulosis will be suggestive. Another rare condition with some points of similarity is that of chronic regional colitis, but here diarrhœa at some stage is the rule and the radiological appearances are much more striking (James 1938).

Death from an appendix epiploica is rare and results from complications, either ileus or peritonitis in the 3 recorded fatal cases.

In the acute and the uncomplicated chronic case treatment consists of the simple removal of the appendage; in some cases local abscesses, general peritonitis, extensive adhesions or obstruction may have to be dealt with. Joffe (1939), as the result of injection studies, makes the point that since the vasa recta of the colon

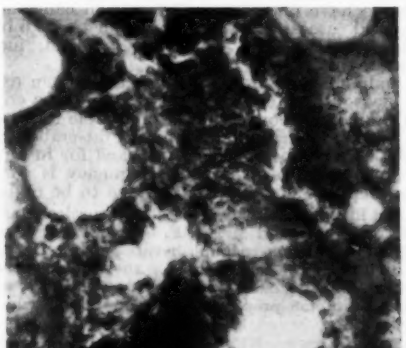

FIG. III—High-power view (× 400). Area of recent hæmorrhage together with the site of former hæmorrhage now being infiltrated with polymorphs and lymphocytes. Some of the fatty tissue remains normal.

often form loops in the appendices during their passage round the bowel the removal of an appendage may endanger the vitality of the intestinal wall. This, as he points out, should discourage the practice of testing colonic circulation after a ligation of the mesocolon by removing an appendix at the appropriate level and watching for bleeding from the stump; but it can be of no importance in relation to the acutely twisted or inflamed appendix where any vascular damage that may occur has already taken place. If, when an epiploic appendix has been removed, there is some possibility of an enclosed diverticulum, the stump should be cauterised and finally inverted. A strangulated hernia containing one or more appendices demands the usual treatment for strangulated hernia, with removal of the contents; the twisted appendage in a hernial sac will either cause or simulate strangulation so that treatment is the same.

SUMMARY

A case of chronic torsion of an epiploic appendix of the sigmoid colon is described.

Of 60 recorded cases of torsion and inflammation of these appendices 46 were acute, 9 chronic and 5 symptom-free. All but 6 were instances of torsion, and 6 of the cases of torsion occurred in a hernial sac.

Preoperative diagnosis is rarely possible in the acute case.

The possibility of chronic disease of a sigmoid appendix should be suggested by the isolated symptom of pain in the left iliac fossa in a patient of middle age.

I wish to thank Mr. Mortimer Woolf, under whose care this patient was admitted, Dr. Roodhouse Gloyne for the pathological report, and Dr. J. N. O'Reilly, the medical superintendent at St. Margaret's Hospital, Epping. Mr. H. Reynolds was responsible for the radiogram and Mr. A. W. Smart for the microphotographs.

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TOPOGRAPHICAL DIFFICULTIES IN DETECTING EARLY FOCI OF PHTHISIS

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(With Illustrative Plate)

In assessing the value of different methods of mass radiography of the chest the important question is whether any particular method makes it possible to detect the really early lesion of phthisis, a focus that may be less than half an inch in diameter. Even a faint shadow of this size or less is easily detected in the lung field of a full-sized radiogram obtained with an adequate technique. In certain situations, however, such foci may be difficult to detect or be missed altogether unless the examiner scrutinises those parts of the film with particular care. Thus the shadow of a small parenchymatous lesion in the horizontal axis of the hilum (fig. I, F1) may be entirely included in the shadow of the hilum in the anteroposterior film, and cannot therefore be discovered unless lateral films are taken routinely; sometimes the focus will be seen only in an oblique film. When the lesion is larger, or situated on a vertical axis corresponding to the outer edge of the hilar shadow, the result will be slight enlargement of the corresponding hilar shadow in the anteroposterior film (fig. I, F2); whenever this is seen, a lateral film should be taken.

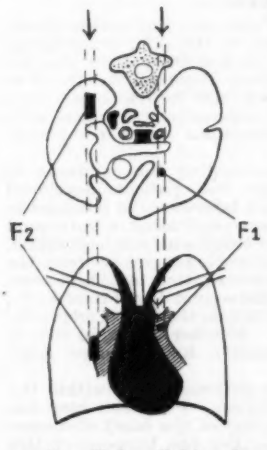

Fig. I—The whole of focus F1 is situated in front of the left hilum and will therefore not be seen at all in the anteroposterior film. As it is also situated to the left of part of the hilum, it may not be seen in the lateral film unless it is very dense; and an oblique film would then be required to separate it from the hilar shadow. Focus F2 is situated behind the right hilum, but is somewhat larger than focus F1 and the axis of its outer border is slightly to the right of the outer edge of the hilum. In the anteroposterior film focus F2 will therefore cause slight enlargement of the right hilar shadow.

The following case is an example of a parenchymatous lesion in the horizontal axis of the hilum.

Case 1.—A boy of 15 was in hospital from Aug. 14 to 26, 1940, where tuberculosis of the prostate and right epididymis was diagnosed; "conservative treatment" and a suspensory bandage were advised. After his notification to the M.O.H. the boy was seen at my clinic a month later, when a cold abscess of the testicle was found to be on the point of bursting through the skin. There were no symptoms referable to the chest, but a radiogram (fig. IIA) showed enlargement of the left hilar shadow; a lateral film (fig. IIB) proved this to be caused by a slightly oval area of infiltration (about 4 cm. in diameter) in the upper lobe, situated in front and partly above the hilum.

A small focus may be entirely covered by the shadow of the clavicle or that of a rib. This is most likely to be found in connexion with the shadows thrown by the anterior parts of the upper three and posterior parts of the upper six ribs since the early focus of phthisis develops most often in the upper lung field. If the course of these ribs is carefully examined the suspicious small area in such a case is not likely to be missed because the superimposed shadow of the pulmonary focus tends to efface the characteristic structure of the bone. By altering the position of the patient or the angle of the X-ray tube slightly (vertical shift) the lesion should be seen on the second film either above or below the rib. This is illustrated by figs. IIIA and B, radiograms obtained in a young adult contact; in this case, however, the focus in the first film was not entirely covered by the shadow of the rib.

The chief purpose of this paper is to draw attention to a third situation where a small focus might be missed—the small area just internal to the tip of the first rib. Shadows are often present in this area owing to irregular calcification of the costal cartilage or to heavy lung markings radiating upwards from the hilum. Moreover, the inner end of the clavicle sometimes covers this area in the film. Hence, on the one hand, additional shadows in this area may be difficult to differentiate, and, on the other, any shadows in this area might be dismissed too lightly as due to the causes given above. In two contacts a too cursory examination of their radiograms led me, perhaps at the end of a busy session, to miss a focus of early phthisis in this situation only to find extensive lesions some months later. These two cases may be a warning to others against committing such an error, and may serve, too, as a reminder of one of the disadvantages of miniature screen photography.

Case 2.—A lad of 17. His sister suffers from advanced pulmonary tuberculosis. Both the patient and another sister were seen as contacts in November, 1938. This sister, aged 14, had no symptoms but a radiogram showed infiltration in the upper two-thirds of one lung (she was admitted to a sanatorium where an artificial pneumothorax was later induced). The patient also had no symptoms, and the radiogram was passed by me as normal; he was told to return in six months, that is, in May, 1940. He did not, however, attend until August, having developed a cough three months before. A radiogram then showed very extensive bilateral lesions (fig. IVB). Reference to the previous radiogram (fig. IVA) showed that in the area just within and below the edge of the left first rib a shadow was present with heavy lung markings below it. It may be assumed that this was already an "early infiltration," and that if the film had been correctly interpreted at that time the patient would have been asked to attend in no longer than a month for another X-ray examination. Failure to do so would, in view of the character of the lesion, have led to repeated efforts by the clinic staff to persuade him to attend, and he would undoubtedly have been brought under treatment at least six months earlier.

Case 3.—A girl aged 11. Her brother suffers from advanced pulmonary tuberculosis. The patient was seen as a contact in October, 1938. There were no symptoms, and a radiogram was passed by me as normal. When seen again in May, 1939, there was no symptoms, she was not X rayed but was told to attend again in August for radiography. She was, however, not seen again until February, 1940, when she complained of no symptoms but had lost some weight. Unfortunately she was not X rayed by the medical officer who saw her but was told to attend again in May. When seen in June she had lost more weight and was complaining of fatigue. A radiogram (fig. VB) now showed much infiltration in the left upper zone and also infiltration internal to and below the right first rib. Reference to the first radiogram (fig. VA) showed that there had then been present at the edge of the left first rib a slight but definite circular shadow. In view of the interval of eighteen months between the two radiograms two alternatives must be considered in interpreting this focus. It represented either an "early infiltration" which progressed unusually slowly or a residual focus of post-primary dissemination, the type that leads to the development of the early lesion of phthisis by intrabronchial spread following its exacerbation, usually during adolescence. Whichever is the true explanation, if the focus had been detected when the first film was seen in October, 1938, the girl would have been examined radiologically at short intervals afterwards and the active lesion would no doubt have been diagnosed some months earlier.

SUMMARY

The detection of early foci of phthisis in a radiogram may be difficult when the focus is situated in front of or behind the hilum or its outer edge, under cover of the clavicle or a rib, or just internal to the tip of the first rib. In most instances these lesions can be demonstrated in lateral or oblique films, or films taken with slight vertical shift.

Illustrative cases are quoted, special stress being laid on the reports of two patients in whom a small focus in

the region of the tip of the first rib was not detected on the first examination and considerable spread of the lesions had taken place before the patients were seen again.

The difficulty in detecting foci in these regions must be remembered in assessing the value of miniature radiography.

TREATMENT OF GONORRHŒA WITH ALBUCID

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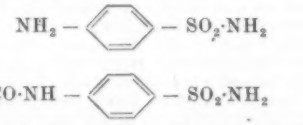
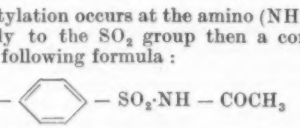
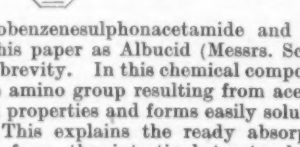
It has been shown that sulphanilamide is partly detoxicated in the body through acetylation and excreted in the urine as an acetyl derivative, which is inactive therapeutically. This is well represented by the structural formulæ of the two compounds:





If, however, acetylation occurs at the amino (NH_2) group attached directly to the SO_2 group then a compound results with the following formula:



This is *p*-aminobenzenesulphonacetamide and will be referred to in this paper as Albucid (Messrs. Schering's trade name) for brevity. In this chemical compound the hydrogen of the amino group resulting from acetylation has weakly acid properties and forms easily soluble salts with alkalies. This explains the ready absorption of this compound from the intestinal tract when it is administered by mouth. After absorption it circulates in the blood and is eliminated largely unchanged by the kidneys. Part is converted into sulphanilamide and a part of this is acetylated in the usual way. Three compounds are therefore found in the urine after the administration of albucid—(1) albucid, (2) sulphanilamide and (3) acetylated sulphanilamide, which is inactive and is found in the smallest proportion (10%). The essential pharmacological features of albucid are that it is more readily absorbed than sulphanilamide; that a higher concentration in the blood is achieved by the same dosage; and that a higher proportion of albucid than of sulphanilamide is eliminated unchanged.

Few investigations have been carried out in this country with this drug, although it has been reported abroad as a useful remedy in gonococcal infections and devoid of toxicity. Batchelor and his co-workers [1] studied its effect in gonorrhœal patients. He used a total dosage per patient of 21 g. and effected cure in four cases out of thirteen. He concluded that the drug is a very feeble curative agent in gonorrhœa and has no place in the treatment of this disease, except in a few patients who prove highly intolerant to sulphapyridine. Lloyd [2] states that albucid has not satisfied our need for an effective but non-toxic remedy.

A hundred male patients suffering from gonorrhœa have been treated with albucid at the Salford V.D. Centre and careful observation carried out as to the disappearance of gonococci, clearing of the urine, intolerance to the drug and extension of the infection. Adequate tests of cure were carried out after cessation of treatment.

METHOD OF INVESTIGATION

All cases were diagnosed clinically and bacteriologically. Only those cases were placed on this treatment who could attend the clinic daily for fourteen days and who were not likely to go away. Urethral smears were taken daily in each case; these were stained by Gram's method and the findings recorded. Urines were also examined and charted daily. In addition to chemotherapy, lavage of the whole urethra with potassium permanganate 1 in 10,000 was given.

The dosage adopted was 1·5 g. by mouth three times a day for 6 days and 1 g. three times on the seventh day, making a total of 30 g.

After the completion of treatment each patient was submitted to the following weekly tests:—

1*st week*.—Daily urethral smears and examination of centrifuged deposits for gonococci. Alcohol advised.

2*nd*.—Aolan given intracutaneously as a provocative; next day urethral and prostatic secretion collected, stained and examined.

3*rd*.—Urethroscopic examination and massage of the urethra over Watson's sound.

4*th*.—Aolan as in the 2nd week.

5*th*.—Silver nitrate 1% instilled into the anterior and posterior urethra; urethral and prostatic excretions examined for pus cells and gonococci next day.

6*th*, 7*th*, 8*th and* 9*th*.—Rest.

12*th*.—General examination of the genito-urinary system and gonococcal fixation test.

If these tests are passed the patient is considered cured.

RESULTS

Albucid is well tolerated, and only one patient developed a morbilliform eruption of the skin, which lasted 24 hours. There was no fever and the patient was not inconvenienced at all. Nothing abnormal was found in the patient's blood. Nausea and headache so often complained of by patients undergoing treatment with other sulphanilamide preparations were completely absent.

Albucid is effective in preventing the extension of gonococcal infection. Only one patient developed epididymitis. He was a dock labourer who indulged in alcohol, and he developed this complication in the second week of the disease. He was cured with sulphapyridine.

The disappearance of gonococci is progressive from the first to the fifth day of treatment; thus in 25% of cases the smears were negative on the second day of treatment; in 61% on the third day; in 12% on the fourth, and in 2% on the fifth day of therapy. In other words, in 86% of cases the smears were negative for gonococci after 2 days' therapy.

The majority of the male patients arrive within the first week of gonococcal infection. Particular care was taken to ascertain the exact day of the onset of disease in all the patients treated. For the purpose of this investigation, immediate therapy means that treatment was begun before the seventh day of disease, and delayed therapy that it was begun after the seventh day. Eighty-six patients came to the clinic before the disease was a week old and fourteen after that time. It will be seen from table I that in eighty-six patients treatment was immediate and in fourteen it was delayed. Those who had delayed treatment showed the better results.

TABLE I—RESULTS OF IMMEDIATE AND DELAYED TREATMENT WITH ALBUCID

Method of administration	Cases	Complete cure	Apparent cure	Relapsed
Immediate	86	63 (73%)	15 (18%)	8 (9%)
Delayed	14	11 (79%)	2 (14%)	1 (7%)

Nine patients failed to pass the tests of cure and relapsed clinically, gonococci being found in the urethral smears or urinary sediments. These cases are carefully investigated, and from long experience it is possible to differentiate between a reinfection and a relapse in any well-controlled case. The following is a typical clinical picture of a relapse case.

The patient usually has not attended daily during chemotherapy.

The urine may have taken longer than usual to clear. He has passed a certain number of tests and then in the middle

1. Batchelor, R. C. L., Lees, R. and Thomson, G. M. *Brit. med. J.* 1940, **1**, 961.
2. Lloyd, V. E. *Hlth & Empire*, 1940, **15**, 20.

of the observation period he has sexual connexion. He usually uses a condom. Within 24 or 48 hours there is a slight urethral discharge.

The urine is clear but contains a few threads. The threads and slides show a few pus cells but no gonococci. After a long search of the slide a pus cell is found with a few devitalised gram-negative diplococci; they do not take up the stain readily, and their shape is suggestive but not so finely demarcated as in the early acute new infections. There are no symptoms of dysuria.

A venereologist who takes and stains slides himself is able to correlate the clinical with the slide picture, and soon learns to differentiate between a relapse and a new infection. If the clinical history corresponds to the slide findings one is almost certain that the patient has relapsed.

The following is the clinical picture of a new infection.

Patient responded well to chemotherapy. Urine became clear and discharge ceased on the second day of therapy. Smears were continuously negative and the urine was clear for 8–10 weeks in spite of sounds and provocative agents. Suddenly, in the tenth or fifteenth week after the original infection, the patient appears at the clinic with a profuse purulent discharge, burning on urination, and the urine is uniformly hazy or cloudy in the two-glass tests. The urethral smear, stained by Gram's method, shows in the first field two or three or more pus cells crowded with gram-negative diplococci. Some of the pus cells appear swollen with their contents. Such a patient usually reports to the clinic on a Friday or Saturday, saying that was the day on which the condition started, and denies at first any sexual exposure. On further inquiry he admits exposure the previous week-end. It is well known that the incubation period is a little prolonged in patients who have had gonorrhœa before.

The question arises, should sexual congress be advised as a provocative test of cure? The method has been advised abroad, but not so far as I am aware in this country.

Out of the hundred cases treated in this series, 74% were good attenders and passed the tests and observation period. Some of them were re-examined 6 or 12 months after the last test of cure. These were taken to be completely cured. Another 17% responded well, attended well and passed all the tests except the last one. Follow-up letters were sent without response. It is assumed that the majority of these are cured, yet they are classified as apparent cures. The total of complete and apparent cures with albucid is 91% and the relapse-rate 9%.

As a control, a parallel series of cases were treated with urethral lavage, and sulphapyridine 3 g. daily for the first week and 2 g. daily for the second week, making a total dosage of 35 g. The results are set out in table II, and it will be observed that the cure-rate achieved with albucid is slightly higher than the rate with sulphapyridine.

TABLE II—COMPARATIVE RESULTS WITH ALBUCID AND SULPHAPYRIDINE

Drug	Cases	Complete cure	Apparent cure	Total cure-rate	Relapse-rate
Albucid ..	100	74	17	91%	9%
Sulphapyridine	100	67	21	88%	12%

SUMMARY

The use of albucid in gonorrhœa was investigated in 100 male patients.

Special attention was given to the disappearance of gonococci in the urethral smears and clearing of the urine.

A cure-rate of 91% was achieved.

Albucid is better tolerated than other sulphonamides, and naus a and vomiting were completely absent.

A parallel series of 100 cases were treated with sulphapyridine and the results with albucid were found to be slightly better.

Although albucid has not secured a place among the various sulphonamide preparations in the treatment of gonorrhœa, this investigation indicates that it deserves further clinical trial.

HEREDITARY FAMILIAL PURPURA SIMPLEX

REVIEW OF 27 FAMILIES

By Eli Davis, M.Sc., M.D.Manc., M.R.C.P.

SENIOR RESIDENT PHYSICIAN AT ST. STEPHEN'S HOSPITAL, L.C.C.

I previously described eleven families with purpura simplex in 2 or more members (Davis 1939). I have since found sixteen other affected families, bringing the series up to twenty-seven (see table).

There are two relevant references in addition to those in my previous paper. Keller (1884), writing of purpura of nervous origin, described a patient with a history of hereditary purpura simplex. Austin and Pepper (1913), in their work on plasma coagulation, had a patient who probably belonged to such a family. In my last report I mentioned a purpuric family seen by Förster (1878) and cited by Pratt; I have now traced Förster's original paper and the family was not similar to any of mine.

The families were collected in thirty months by interrogating and examining all my female patients for purpura, by interrogating the hospital female staff, by the coöperation of the medical and nursing staff, and by tracking down and checking every clue obtained. Two women from different parts of Eire told me that the "bruises" (spontaneous ecchymoses) were well known in their localities, where they were called "dead man's nips" or "dead man's pinch."

DISTRIBUTION OF PURPURIC MEMBERS IN TWENTY-SEVEN FAMILIES

Family	Purpuric members in four generations: First	Second	Third	Fourth	Total	Family	Purpuric members in four generations: First	Second	Third	Fourth	Total
I	1	1	2*	..	4	XV	2	..	..	..	2
II	2	2*	..	..	4	XVI	1	3	..	..	4
III	1	2	1	..	4	XVII	1	2	1	..	4
IV	2	3	..	..	5	XVIII	1	2	1	1*	5
V	1	1	..	..	2	XIX	1	1	..	..	2
VI	1	1	..	..	2	XX	3	..	..	..	3
VII	2	..	..	..	2	XXI	1	2	..	..	3
VIII	2	..	..	..	2	XXII	1	1	..	..	2
IX	1	1	..	..	2	XXIII	3	..	..	..	3
X	2	..	..	..	2	XXIV	2	..	..	..	2
XI	2	2	..	..	4	XXV	1	4	3	..	8
XII	2*	4	1	..	7	XXVI	3	..	..	..	3
XIII	2	..	..	..	2	XXVII	1	2	..	..	3
XIV	1	1	..	..	2						

* One male.

In nine of the twenty-seven families purpura occurred, as far as was known, in 1 generation only, in twelve in 2 generations, in five in 3 generations, and in one family in 4 generations. Since my last paper was written the daughter of E. F. (family III) has proved to be purpuric, and the twenty-seven families now include 88 members with spontaneous skin ecchymoses, of whom 84 were females; the 4 males came from four different families. I personally confirmed the purpura in 53 subjects, and in 35 others there was a convincing history. In later generations purpura as a rule appeared at progressively earlier ages, and purpura tended to affect younger members of a given generation earlier in life.

The 88 cases comprised: (*a*) 79 with purpura simplex; (*b*) 4 with Schönlein purpura; (*c*) 2 with Schönlein-Henoch purpura; (*d*) 2 in different families who bruised on trivial injury (both suffered from active rheumatoid arthritis); and (*e*) 1 with pseudohæmophilia. Non-purpuric relations were free from pathological bleedings. Of the 88 there were only 7 persons with unusual bleedings in addition to spontaneous ecchymoses. These included the 5 enumerated in (*c*), (*d*) and (*e*) above; a sixth had severe bleedings associated with terminal nephritis, and the seventh hæmoptyses believed to be due to phthisis (family XI, Davis 1939). The pseudohæmophilic, a boy, was reported to have serious bleedings, and was the only example of purpura in the fourth generation. His was the one family supporting Tidy's (1926 and 1937) view that purpura should never be regarded lightly. The capillary-resistance test (Davis

1940) was positive in approximately half the purpuric cases. Blood investigations, as in the earlier paper, proved negative, but the pseudohæmophilic was not seen personally.

Rheumatism.—There was often evidence of rheumatic fever in the form of a clear history with a report of long treatment in bed; physical signs were sometimes present in addition. Thus, in fifteen families, of 57 purpuric members 23 gave evidence of rheumatic fever and so did 7 near relations. In five other families there were 13 purpurics of whom none had had rheumatic fever but 6 near relations had had the disease. In the remaining seven families there was no rheumatic fever. The incidence of rheumatoid arthritis was investigated. In seven families, of 19 purpuric members 8 had rheumatoid arthritis past or present, and so had 2 near relations; in one other family with 2 purpurics, 1 near relation had the disease. In five families there was no evidence of rheumatic fever or rheumatoid arthritis, but in three of them purpuric members had severe fibrositis or arthritis. Of the 88 purpurics 15 had arthritis distinct from the rheumatoid type or rheumatic fever, and others had had severe fibrositic (or myalgic) pain. Evidence of rheumatic fever, arthritis or severe fibrositis was present in 60 of the purpuric persons. This suggests a special association between purpura and rheumatism, in these families at least. Indeed, in some families the ecchymoses were traditionally known as "rheumatism bruises." It is well known that rheumatic features (joint lesions and fibrositic or myalgic pains) may occur in purpurics, but I suggest that if purpura is carefully sought among the various "rheumatic" patients, it will be found fairly commonly.

Tuberculosis.—The incidence of tuberculosis was noted. In one family, with 3 purpuric members, a purpuric woman, 2 of her sisters and 3 out of 6 children of one of these sisters had had tuberculosis. In another family with 4 purpuric members, the father and son of one and the daughter of another purpuric member suffered from the disease. In two other families there was a purpuric who had suffered from tuberculosis; and in two more families a purpuric's sibling had had tuberculosis. Another 3 purpuric members of different families had tuberculous children.

Telangiectasis.—Familial purpura simplex was associated with familial telangiectasia and a pronounced liability to epistaxis in two families. The only description I have found of purpura associated with telangiectasia was in one case reported by Wittkower and Rarey (1933). This association seems evidence of a link between Osler's disease and the purpuras.

I hope later to submit this material to expert genetic analysis, but in some families the hereditary transmission could be explained on the basis of a dominant gene with partial sex limitation.

SUMMARY

Hereditary familial purpura simplex is common. Twenty-seven families are reviewed, comprising 88 members with spontaneous skin ecchymoses of whom 84 were females. Of the 88 cases 79 had purpura simplex, 6 purpura of the Schönlein or Schönlein-Henoch type, 2 bruised on trivial traumata, and 1, a boy, had pseudohæmophilia. Other abnormal bleedings were almost completely absent in purpuric members and their relations. In two of the families familial telangiectasia was a feature. Of the 88 cases, 23 gave a history of rheumatic fever, 8 of rheumatoid arthritis, 15 of some other form of arthritis, and others of severe fibrositis. These figures suggest a special association between rheumatism and purpura.

I wish to thank Dr. W. Allen Daley, medical officer of health to the London County Council, and Dr. D. S. Sandiland, medical superintendent of Stephen's Hospital, for permission to publish this paper.

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MALIGNANT HYDATIDIFORM MOLE
COMPLICATED BY TORSION OF A FIBROID

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A PRIMIGRAVIDA aged 31 was referred to the antenatal clinic of the Princess Mary Maternity Hospital on account of intermittent vaginal hæmorrhages of three days' duration, severe abdominal pain lasting twelve hours, and an irregular mass in the abdomen.

She had been married for nine years, and though she and her husband were anxious to have a child she had not become pregnant until August, 1939. Her last period was on July 31, 1939, and when I saw her she was two months pregnant. For some years after her marriage her periods had lasted 8–10 days and were heavy, but she had not sought medical advice and for the last three years they had only lasted for five days and the loss had been smaller. Since missing her last period there had been some morning sickness, frequency of micturition and pain in the breasts. On Oct. 7 she had a bright red loss from the vagina, and another on Oct. 9; between, there was a slight brown discharge. On the night of Oct. 9 she was seized with violent abdominal pain just above the symphysis pubis and slightly to the left of the midline.

When I examined her on the 10th she described the pain as aching in character. The uterus was enlarged to the size of a two-months pregnancy and in the abdomen was a hard irregular swelling separate from the uterus. It was very tender and was about the size of an orange; it was quite mobile and did not move with the uterus neither did the uterus move with the tumour. It was above and slightly behind the uterus and was almost rock like. I made a diagnosis of pedunculated fibroid with torsion or degeneration, and threatened abortion and she was admitted to hospital. Not wishing to interrupt the pregnancy if it could be avoided I kept her under observation. That night she had another attack of abdominal pain with rising pulse-rate and rigidity of the abdominal wall over the whole of the lower abdomen, and I decided to perform a laparotomy.

The tumour proved to be a fibroid 4 in. in diameter, with a pedicle 2½ in. long and twisted three times. Its base was attached to the fundus of the uterus, medial to and slightly behind the left uterine cornu. It was easy to perform myomectomy. The uterus and adnexa were otherwise normal. Next day there was another bright red loss of about 2 oz. She was given liberal doses of morphia for the first three days after operation and 2 mg. of Progesterone daily for the first week. After the fourth day there was no further vaginal discharge. She made a good recovery and left hospital a fortnight after operation.

On Nov. 12 she was admitted again on account of further bleeding, and also because of hyperemesis which had begun six days before. She was now about twelve weeks pregnant, but the uterus reached to the umbilicus. This, I thought, might be due to blood-clot in the uterus, but in view of the hyperemesis I suspected hydatidiform mole. She was radiographed and no fœtal parts were seen. A senior member of the hospital staff considered that the ovum was dead and that blood-clot in the uterus was probably responsible for the increase in size, and suggested that this would be confirmed if the Aschheim-Zondek test was faintly positive. While the test was being carried out the vomiting increased and the discharge persisted. The result of the test was "very strongly positive." The uterus was therefore explored from below. As soon as dilatation was begun severe bleeding started; ovum forceps were introduced and a piece of hydatidiform mole withdrawn. I dilated the cervix as far as possible but being unable to insert even a finger, I performed an abdominal hysterotomy and attempted to evacuate the uterus. At one place on the posterior wall the mole was closely adherent, and appeared to be invading the uterine muscle, so, despite her desire for a child I performed a total hysterectomy. She made a good recovery and was discharged three weeks later.

The pathologist reported that the specimen was a hydatidiform mole which had undergone malignant degeneration to chorion epithelioma of low malignancy.

The patient was readmitted to hospital on Jan. 10, 1940, for some obscure attacks of dyspnœa. On two occasions she had suddenly sat up in bed, became cyanosed and had difficulty in breathing. The attacks

passed off as suddenly as they had come, and there were no physical or radiological signs to account for them. An Aschheim-Zondek test was negative in all dilutions. The nature of the attacks has not been explained and they have not recurred. She has remained well since.

Reviews of Books

Special Surgery in War Time

Edited by Sir HUMPHRY ROLLESTON, Bt., M.D. Camb., F.R.C.P., and ALAN MONCRIEFF, M.D. Lond., F.R.C.P. London: The *Practitioner* with Eyre and Spottiswoode. Pp. 74. 6*s*.

THIS little book can be read and digested in an evening. Five special aspects of war surgery have been dealt with, each by an expert; and the general practitioner, called on perhaps for the first time to tackle such problems, is well instructed in the principles of preliminary treatment. In the first chapter Mr. Northfield gives an account of head injuries and their management. Trotter's practical classification is adopted and the treatment of the various types of syndrome carefully explained. More stress could have been laid on the danger of attempting to reduce the pressure of the cerebrospinal fluid unless there is definite evidence that it is raised. Moreover, the intravenous administration of hypertonic sodium chloride or hypertonic glucose is advised as a satisfactory alternative to hypertonic sucrose in lowering the cerebrospinal fluid-pressure; both these substances, however, after producing an initial fall in pressure, tend to diffuse through the choroid plexus into the cerebrospinal fluid and to induce by their own osmotic tension a reactionary rise in the pressure which, in the case of sodium chloride, may be serious. Sucrose does not exhibit the same tendency and may properly be used for this purpose. Dr. McAlpine describes injuries to the spinal cord; his advice is sound if somewhat didactic on problems still the subject of discussion. In the management of the paralysed bladder he adheres rigidly to the time-honoured method of intermittent catheterisation followed by an indwelling catheter. The disadvantages of this practice are admitted in his description of the "inevitable urethritis and mild cystitis" which accompany it. Even with these disadvantages, this way of dealing with the paralysed bladder may prove to be the best, but evidence is accumulating to show that the practice of leaving the bladder alone and allowing it to empty itself spontaneously or with the help of carefully applied suprapubic pressure has much to be said for it, especially where the patient is nursed in a ward in which there are septic cases.

Mr. Zachary Cope is given the unenviable task of discussing abdominal wounds in eleven pages. He has therefore confined himself to principles, but it is essentially the details of intra-abdominal manipulations which are important to the inexperienced surgeon. A description of the physical signs of intraperitoneal hæmorrhage and infection is valuable. Mr. Holmes Sellors, in dealing with the surgery of the chest, has had a relatively easier task, for, although the subject has almost as wide a range as the surgery of the abdomen, there is a distinct division between the preliminary treatment and the later treatment involving a planned thoracotomy. Mr. Holmes Sellors deals only with preliminary treatment and manages to include in a short chapter the essentials of diagnosis and immediate treatment of such conditions as pneumothorax, hæmothorax, surgical emphysema, pulmonary atelectasis and "sucking" wounds. He does not make it quite clear when he would advise the aspiration of a hæmothorax; "as soon as the risk of further bleeding has passed," he says. From 24 to 48 hours is common advice. Like many others writing of chest wounds he states that blood tends to remain fluid in the pleural cavity; but many surgeons have had to ladle out lumps of blood-clot the consistency of liver from a pleural cavity wounded only a few hours previously.

In a chapter on burns Mr. Wallace has wisely avoided the controversy now raging over treatment. He has indicated that differences of opinion exist but has at the same time stated his preference for the use of tannic acid. An appendix on the use of the sulphonamide drugs in prophylaxis and treatment serves to round off a good book.

Hutchison's Food and the Principles of Dietetics

(9th ed.) Revised by V. H. MOTTRAM, M.A. Camb., professor of physiology at King's College of Household and Social Science in the University of London; and GEORGE GRAHAM, M.D. Camb., F.R.C.P., physician to St. Bartholomew's Hospital, London. London: Edward Arnold and Co. Pp. 648. 21*s*.

THE new edition of this well-known book is full of common sense, giving in relatively simple form reliable information on our present knowledge of dietetics. In no way is it sounder than in its emphasis on the fundamental fact that there is no one scheme of diet which is perfect—partly because we have not reached finality in deciding the composition of such a diet, and partly because allowance must be made for individual idiosyncrasies. Humanity is not cast in a common mould. The search for the optimum diet is no doubt a laudable activity but it is chasing a will-o'-the-wisp. Even if the optimum diet were found for A, B, and C it would just as certainly not be optimal for X, Y, and Z. The editors found themselves called upon to decide whether to produce a modern version of the original text or to reconstruct the book radically. They rightly selected the second alternative, although this has led to the disappearance, with the exception of the historical introduction, of much of the original matter.

The first two parts, which in the main may presumptively be ascribed to the hand of Professor Mottram, give a careful review of the principles underlying diet and of the nature of the various foodstuffs constituting the average or normal diet. These principles are too often overlaid, in textbooks, by the meticulosities of the academic laboratory worker; but life and money are too short to achieve complete accuracy in dietetics, as the writer of this section points out. "We can make average estimates," he says; "we may lay down average 'laws' for the feeding of the people . . . the average man needs so many calories per day and the average woman so many less. We may speak of average figures but if we apply these figures to the individual we are lost." In the section on mineral requirements the editors remind us that the chemical analysis of a foodstuff gives no real information about the availability of its mineral constituents. Spinach, for example, with about 4 mg. of iron per 100 g. is no more effective in the treatment of artificially produced anæmia than tomatoes which contain about a tenth of this amount of iron. It is not the total quantity of any mineral present but the availability which counts. Vitamin requirements are assessed cautiously; the data available do not, as yet, permit of hard and fast standards being laid down. It is doubtful whether all dietitians would agree that a vegetable diet "prostitutes nervous energy." It might be possible to argue like that about a cow, but what about a bull?

The second part of the book is clinical; the principles of feeding in infancy and childhood are covered by Dr. G. F. Harris, and the treatment of disease no doubt by Dr. Graham. It includes a tabular summary of the composition of most infant foods on the market and a full list of the various vitamin preparations. This part of the book deals well with clinical dietetics, but might with advantage have been more detailed.

Atlas of Cardioroentgenology

By HUGO ROESLER, M.D., F.A.C.P., associate professor of roentgenology in the Temple University School of Medicine, Philadelphia. Springfield, Ill.: Charles C. Thomas. Pp. 124. £2 7*s*.

THOSE who have read "Clinical Roentgenology of the Cardiovascular System" will welcome another book by the same author. His new volume covers a large field of cardio-radiology, and deals especially with the commoner diseases. It is presented as a series of case-reports, and is profusely illustrated. Full clinical details of the cases included are given. In order to correlate the radiological appearances with the pathological findings, in those cases which came to autopsy, the heart, great vessels, trachea, and main bronchi were removed entire. The specimens were placed as nearly as possible in the positions in which the radiograms were taken, and photographs were thus obtained which can be compared with the original films. By these means the shadows seen

can be explained. Dr. Roesler suggests that the anterior film of the heart should not be taken in the full phase of inspiration because this tends to distort the cardiac shadow. Details of the radiographic technique employed are given in the introduction. It is difficult to believe that anterior films of an average-sized adult can be taken at a focal film distance of 6 ft. in $\frac{1}{10}$ sec.—even when employing a rotating anode tube and high milliamperage—without the sacrifice of contrast to speed. A 4 ft. focal film distance is recommended for the lateral view although in this position the depth of the chest is increased, and the distortion of those structures furthest from the film must thereby be enhanced. It seems a pity that X-ray kymographic studies of some of the hearts shown were not included.

Actinotherapy and Diathermy

For the Student. By E. B. CLAYTON, M.B. Camb., director of physical treatment department, King's College Hospital. London: Baillière, Tindall and Cox. Pp. 196. 8*s.* 6*d.*

THIS manual is intended primarily for students preparing for the C.S.M.M.G. examination but medical students and practitioners who wish to acquaint themselves with this form of physical therapy will find the book readable and informative. In the new edition, revised and slightly enlarged, Dr. Clayton gives a good account of the physical factors in treatment, describes the apparatus in common use and adds sufficient clinical matter to suggest the cases most likely to be benefited. There are one or two minor criticisms. Not every clinician will agree that ultraviolet radiation will cure unaided any form of anæmia, and high blood-pressure is seldom lowered, except possibly for a short time during and immediately after treatment. It might be objected, too, that aniline dyes painted on the unbroken skin are likely to act as a screen to actinic rays and that the injection of s nsitising drugs which Dr. Clayton recommends has proved disappointing and not entirely free from harmful complications and accidents. Dr. Clayton's proper insistence on the dangers of irradiation in active phthisis is weakened by his suggestion that an erythematous reaction of the skin of the chest wall is the danger to be mainly avoided. The book as a whole is a sound exposition, elementary only in so far as unnecessary detail and controversial matter has been excluded.

A New Dictionary of Chemistry

Edited by STEPHEN MIALL, LL.D., B.Sc. London: Longmans Green and Co. Pp. 575. 42*s.*

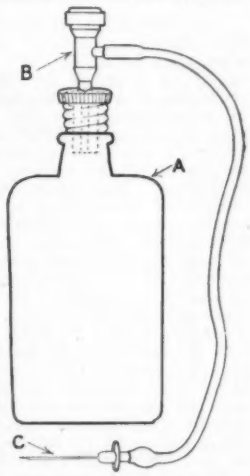
THIS book by Dr. Miall and 22 collaborators is of handbook dimensions. Into it they have compressed a mass of information from the fields of organic and inorganic chemistry and biochemistry, theoretical and practical, pure and applied. From the brevity of the articles the book is entitled to be called dictionary; but definitions as such have been mercifully avoided where such attention to form would obscure clarity and purpose. For organic chemistry the individual compounds are given under their common names, and almost always with the structural formula attached. In addition, the better-known organic reactions are given by the names of their discoverers (although one misses the Hell—Volhard—Zelinsky, which gave so much pleasure to adolescent minds). Substances of biochemical and pharmaceutical importance are given in great number, while chemical engineering is represented by many industrial plants, processes and products. In addition there are short biographies of eminent chemists and physicists, with some remarkable omissions, such as Kuhn, Meyerhof, Michaelis, Warburg and Szent-Györgyi.

With its numerous and up-to-date references to drugs this dictionary should prove useful to medical men and pharmacists as well as to chemists. The excellent notes on biochemistry might well be learnt by heart by those in that calling who are often asked what a biochemist is. The book ends with a table giving the physical constants (melting-points, boiling-points, densities and specific rotations) of a large number of organic compounds. If in future editions a sixth column could be inserted containing references to approved methods of preparation of the compounds the research worker's gratitude would be complete.

New Inventions

A CONVENIENT METHOD OF GAS-REPLACEMENT

IN replacing a pleural effusion an apparatus which includes a vacuum bottle is preferable to a three-way syringe. When a syringe has been used in an attempt to remove all the fluid, it is often possible by changing over to a Potain's aspirator, for example, to remove further fluid at the same session. Complaints are constantly made, however, about the Potain's aspirator. Even if it is carefully looked after it is apt to develop leakage points, and if two or more replacements have to be done at the end of a busy artificial-pneumothorax clinic delay is caused because the whole apparatus has to be cleaned after each replacement. The method described here overcomes these difficulties by enabling one to keep in the clinic or consulting-room apparatus which includes a number of exhausted bottles already prepared in advance. If a patient with an artificial pneumothorax and fluid in the chest is found to need a gas replacement it is possible to do this in a few minutes without further preparation. If several replacements have to be done in succession it is only necessary to take a fresh bottle and boil one short length of rubber tubing and a metal valve. When active treatment is required for hæmothorax due to war injuries the apparatus is convenient because it is standing ready for use.



The bottle marked (A) in the figure (40 oz. U.G.B. No. 12812) arrives with an aluminium screw cap and thick rubber diaphragm. A hole, $\frac{1}{4}$ in. in diameter, is cut in the centre of the cap with a metal punch. A rubber bung pierced by two holes (supplied by Messrs. Rothband, Manchester) is fitted to the bottle and the rubber diaphragm is placed over the bung; an ink mark is made on the diaphragm to indicate the position of one of the two holes in the bung. The cap is placed over the diaphragm. A vacuum is produced in the bottle by piercing the diaphragm over the hole in the bung with a hollow needle and attaching the needle by tubing to a water-suction pump or a hand pump. Such apparatus can generally be found in a hospital dispensary, or can be easily made by fitting a suitable valve to a small tyre-pump or garden syringe. It is an advantage to start the process of exhausting by rinsing the bottle with very hot water and then replacing the bung and cap. By using a meter to read the degree of vacuum produced it is possible to find out what reading indicates a vacuum sufficient to suck fluid up to the neck of the bottle. Bottles so exhausted will retain their vacuum for long periods, and the maintenance of the vacuum is ensured by putting a collodion seal over the rubber cap. If it is necessary to sterilise the bottle it can be autoclaved with a little water at the bottom and the cork unscrewed.

The valve (B) has a needle for piercing the diaphragm, and is supplied with the Baxter Transfuso donor set for blood-transfusion. It is expensive but can hardly deteriorate, is easy to clean, and gives perfect control of the vacuum applied to the pleural cavity. The valve can be dispensed with altogether and a needle fitted instead to the tubing; the vacuum can then be controlled by a screw clip on the tubing, but control may not be so perfect as with the valve. The needle (C) is a Morland's artificial-pneumothorax needle or initial Riviere needle and is kept with 18 in. of pressure tubing ready sterilised in spirit in a screw-capped bottle.

I wish to thank Mr. T. Watkin Thomas, Ph.C., pharmacist to the Norfolk and Norwich Hospital, for his help in devising this apparatus.

STEPHEN FALLA, M.D. Lond., M.R.C.P.

Advice on the attainment of sleep

Let your night cap be of scarlet; and this I do advertise you, to cause to be made a good thick quilt of cotton, or else of pure flocks or of clean wool, and let the covering of it be of white fustian, and lay it on the featherbed that you do lie on . . .

ANDREW BADE (Advice on the attainment of sleep from "A Compendious Regyment 1557")

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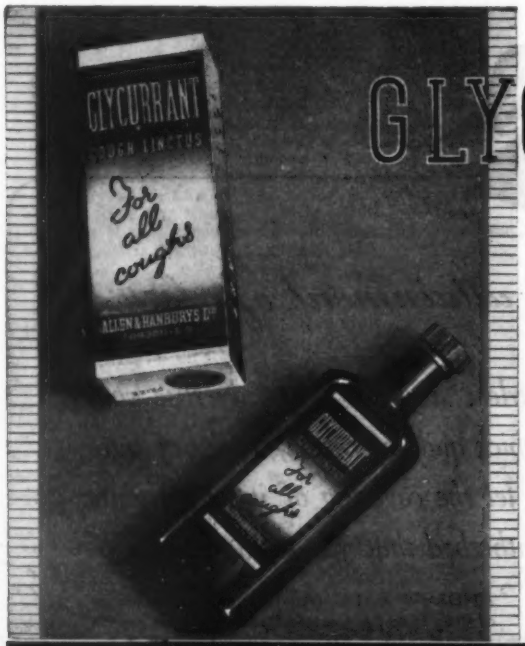

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THE LANCET

LONDON: SATURDAY, FEBRUARY 1, 1941

ARTIFICIAL SHORTAGE OF DOCTORS

PEOPLE will go short of anything and be cheerful about it if everyone fares the same; it is the inequality that chafes. Lord WOOLTON is seeing that in food we all share alike, but there are other directions in which rationing is equally urgent. Half way only through the winter, when doctors are always at their busiest, and approaching the influenza season which despite the Health Ministry's assurance is already upon us, we are faced with a shortage of doctors. And why? There are at least 64,000 names on the Medical Register and there was a record entry in 1939. Before this war the increase of qualified men and women more than kept pace with the increase in the population—enough to give service of a recognised standard to all needing it. There has been no major epidemic; the number of war wounds has been less for the whole period than during a single engagement in the last war; air-raid injuries, distressful in a few populous centres, have not reached a large aggregate. And yet everywhere there is a growing anxiety, now becoming acute, that the civilian doctor will break down under the strain, and the sick and injured will suffer for want of medical care. Obviously on the pre-war standard there is no real shortage; it is just a matter of distribution, and the good sense of the nation would welcome a scheme of rationing doctors which would result in their equitable distribution, as it has welcomed the rationing of food.

It is no secret that the situation is due to the steady and insistent demands of the fighting services for more doctors, and primarily to the demand of the Army for doctors under its exclusive discipline. Nor would there be any fault to find with this demand, for everyone recognises the paramount need of efficiency in the services and no sacrifice would be regarded as too great to meet it. We are not confronted here by the sordid clash of rival claimants for personal ends but the generous aim of giving the fighting man his due in care and comfort. It is clear however that this can no longer be served by the severance of the medical pool into four parts—one for the Army, one for the Navy, one for the Air Force, and one for the civilian—each with its own specialists and its own special centres. For example, the Army has 12 orthopædic centres in addition to those of the E.M.S., with their own establishments to maintain and their own call on occupational therapists and rehabilitation experts, and there are not enough trained instructors to go round. The shortage of other specialists, the great body of regional surgeons—eye, ear, nose and throat, and what not—is equally fictitious: the total of their potential patients has not gone up, they have not more work to do in the aggregate. If specialist help is lacking anywhere it is because the specialist is marking time elsewhere. It is uneconomic—some say it is mad—to try and run four services when a common pool would economise all the effort.

There is of course one rider to this self-evident proposition. Hitherto our fighting services have chiefly been concentrated on this island where their medical needs are the same as those of the Home Guard and the front-line civilians—in a word, of the whole able-bodied population. Increasingly they may be going overseas where each unit will have its own medical complement. This is a question of arithmetic. It is known, although not revealed, what this complement means in numbers; deduct that figure now, add a generous proportion for the unknown and the unknowable, pool the rest for general home service, and let everyone share the base hospitals. No-one would suffer. It would require some hard thinking, but the chiefs in all the services are used to that and they will infuse their deputies and subordinates with their own efficiency and reasonableness. Now is the time to do it. The medical profession is willing and the public expects its resources to be used frugally and wisely. If we adapt our medical organisation to meet the war-time needs which we now clearly see, we shall be in a far stronger position to serve the country in our own way when war is done.

PULMONARY FAT-EMBOLISM

NOT many of us would put fat-embolism among the commoner complications of severe injury, yet R. B. WRIGHT[1] wrote that "fat-embolism should be considered in any case where there are grave or unusual symptoms following trauma, whether the trauma be fracture, contusion, concussion, intravenous therapy, delivery or operation," and on another page Dr. ROBB-SMITH reports on a series of 115 fatal accidents in 41 of which gross fat-emboli were present and were considered a major factor in causing the death of 29. This new report leaves no doubt as to the reality of the condition and demonstrates the need for research into its causation, symptoms and treatment, of which little is yet known.

Neutral fat normally circulates in the blood as an emulsion fine enough to pass through the tissue capillaries, but in fat-embolism bigger globules appear which obstruct the capillaries in the lungs and may pass on to reach the brain, kidneys or any other organ. It is by no means clear where these globules come from. Probably the commonest source is the depots, and especially the bone-marrow, since in the great majority of cases fat-embolism follows fracture of a long bone, but there are difficulties in explaining all cases in this way. Thus in 6 of ROBB-SMITH'S cases where fat-embolism was thought to be a major fatal factor there was no bony injury, and there have been instances of fat-embolism following manipulation of stiff joints. It has therefore been suggested that products of tissue destruction circulating in the blood may interfere with the emulsification of the plasma fat. A large fat-embolus may, as in one of ROBB-SMITH'S cases, act as a blood-clot does in obstructing the pulmonary artery or one of its main branches, but the mechanism by which smaller emboli endanger life is uncertain. WARTHIN[2] gave eight points to look for in making a diagnosis of fat-embolism: (1) injury to

1. *Ann. Surg.* 1932, **96**, 75.
2. Warthin, A. S. *Internat. Clin.* 1913, **4**, 171.

bone-marrow or adipose tissue; (2) a cardiac, pulmonary or cerebral complex, or all combined (restlessness, stupor, coma, dyspnœa, cough); (3) free fat droplets and fat-containing alveolar cells in the sputum; (4) free fat droplets in the urine; (5) fat droplets in the retinal vessels; (6) fat droplets in venous blood; (7) fever rather than a subnormal temperature; and (8) petechial hæmorrhages in the skin. Unfortunately, however, the more definite of these signs may not appear until comparatively late, and may not help with the desperately ill patient where a differential diagnosis has to be made from secondary shock or hæmorrhage. The task is often complicated by the association of fat-embolism with shock or hæmorrhage. ROBB-SMITH describes the usual clinical course. The symptoms come on after an interval lasting from a few hours to several days (less than five), after which the patient becomes short of breath, pale, cyanosed and restless, bringing up frothy œdema fluid with little coughing; there is fever with quick pulse and respirations, but—a valuable point in diagnosis—the blood-pressure does not fall. Next may come symptoms from systemic emboli—signs of cerebral irritation, stupor, or palsies, sometimes with hyperpyrexia, petechiæ and so on. Later still there will be signs of pulmonary consolidation. In the fatal case there should be no difficulty in demonstrating the fat emboli in fresh sections of lung. JOAN ROSS [3] describes the lungs in fat-embolism as deeply congested throughout, with no localised hæmorrhagic patches.

The importance of making an accurate differentiation of fat-embolism from shock or hæmorrhage lies in the different treatment required. In fat-embolism the dangers of pulmonary œdema and overloading the right side of the heart may be increased by raising the blood-volume, but ROBB-SMITH suggests that no harm will be done by transfusion before symptoms appear. The only prophylactic measure which can be adopted in our present ignorance of causation is early immobilisation of injured parts, and when fat-embolism has developed oxygen should be given with barbiturates rather than morphia for pain. Various measures to render the circulating fat harmless have been tried and there is urgent need for further experimental work on them. There is need, too, for inquiry into the part played by fat-embolism in the production of the pulmonary symptoms observed in people who have been exposed to high explosives. ROBB-SMITH maintains that these symptoms may be due to a combination of pulmonary concussion and fat-embolism. ZUCKERMAN,[4] however, has noted no fat-embolism in the lungs of animals exposed to blast. He has pointed out that in air-raids people are subjected not only to the blast wave itself but also to such secondary effects as violent displacement and the impact of flying masonry. The secondary effects are as a rule associated with some form of external injury, occasionally with fractures and often with pulmonary hæmorrhages. It may well be that pulmonary fat-embolism arises from these secondary effects and not directly from blast, and this point can only be cleared up by further investigation. Fat-emboli should be specifically looked for in autopsies on air-raid casualties, and the examination should be amplified by an accurate appraisal of the circumstances under which the casualty occurred. The findings of such a two-sided investigation may affect the whole treatment of air-raid casualties with pulmonary symptoms.

3. *Brit. med. J.* Jan. 18, 1941, p. 79.
4. Zuckerman, S. see *Lancet*, Jan. 25, 1941, p. 110.

DIAGNOSIS OF GASTRIC CARCINOMA

IT has been said that carcinoma of the stomach appears as two diseases, so different are the manifestations of the established and almost hopeless condition from the hardly noticeable signs of a still operable growth. Students used to be taught that carcinoma of the stomach is characterised by progressive weakness, loss of weight, loss of appetite, indigestion and vomiting, and presents on investigation an epigastric tumour with absent or deficient hydrochloric acid in the gastric juice. Unfortunately these well-recognised features are only those of advanced disease with poor prospect of cure. The chance of the growth being operable at this stage is only about one in three, and even then the risk of death as the immediate result of radical removal, even in the most competent hands, approaches the same ratio. The further outlook for the survivors of the operation is that only one out of four will be alive and well five years later. The fact that a quarter of all deaths from cancer are due to growths arising in the stomach completes the outline of a problem and a challenge to the medical profession which it will only be able to meet by a critical revision of the present methods of diagnosis.

Earlier diagnosis would not only increase the operability-rate and the proportion of ultimate cures but would also greatly reduce the operative mortality, since the dangers are referable, directly or indirectly, to the infection of a large sloughing mass in the stomach. But early diagnosis is often missed because of failure to recognise the malignant basis of the initial mild digestive disturbances. In many instances early carcinoma of the stomach gives no indication whatever of its presence; it may even remain "silent" until a rapid onset of late symptoms reveals a hopeless condition. In most cases, however, there is a longer or shorter intermediate stage between early and late disease, in which the patient experiences mild epigastric discomfort, flatulence and loss of vigour. The recent analysis of nearly 11,000 cases at the Mayo Clinic [1] from 1907 to 1938 indicates that half the patients had initial symptoms of this sort, a quarter had ulcer-type symptoms, while the remaining quarter had non-gastric symptoms such as anæmia or asthenia. Most patients think nothing of these mild disturbances, but their persistence may bring the intelligent person to his medical adviser. It is at this point that a tragedy too often happens for there may be no abdominal tumour to be felt, and the doctor will reflect that, after all, the patient's appetite is unimpaired and his weight is steady. Suspicion may be further allayed by the finding of acid in the test-meal and a reassuring improvement may follow the prescription of a carminative. So the months pass by, in which the patient's chance of life evaporates, until a little jaundice or a coffee-ground vomitus reveals too late the grave character of the illness. The American citizen is perhaps luckier in his experience, for he has read in the lay journals about cancer and has seen

1. Walters, W., Gray, H. K., Priestley, J. T., Lewis, E. B. and Berkson, J. *Proc. Mayo Clin.* 1940, **15**, 625.

whole-page advertisements of life-insurance companies about the possible seriousness of this or that symptom. Moreover, when he presents himself with his flatulence for a "check-up" instrumental and radiological investigations are more readily applied than in England; indeed, radiography may even precede the examination of the patient. English medicine justly prides itself on its teaching of thorough primary clinical examination, but we are perhaps too much biased by a negative result from palpation and inspection, particularly in the field of dyspepsia, and tend to delay direct investigation. On another page Mr. HERMON TAYLOR condemns the practice of the temporising carminative as a "therapeutic" test for carcinoma of the stomach and rightly insists that a full gastric investigation must be made *at the beginning* in any patient whose dyspepsia, however mild, arises after the age of forty. And, it may be added, the doctor must steel his courage against the probability of many negative results and criticism for undertaking "unnecessary" investigations—for making a fuss.

The first investigation in suspected carcinoma of the stomach is of course radiological; and routine X-ray examinations on the American model deserve more universal application. Positive evidence of a filling defect or an area of infiltrated gastric wall is usually decisive and in the group of cases at the Mayo Clinic in which the growth was removable a definite diagnosis of malignancy was made by the radiologist in 75% and a doubtful diagnosis in another 13%. A negative or inconclusive radiogram should not however be accepted without further investigation by the gastroscope since the smallest growths and hence the most favourable cases can only be detected by this method. The need is for a precise anatomical diagnosis and gastroscopy can give it. It even makes analysis of gastric juice for acid or of fæces for blood superfluous when malignant disease is in question. During the last five years the gastroscope has revolutionised the investigation of gastric disease, just as the cystoscope has changed the principles of diagnosis in genito-urinary disease during the last three decades. Seeing is believing, and it is now possible to be precise in a field of medicine which has been more befogged by ill-founded hypotheses and circumstantial evidence than almost any other. The technique of gastroscopy has been much simplified by Hancock's method of anæsthetising the throat with Decicain lozenges, while HERMON TAYLOR'S new instrument, which provides controlled instead of passive flexibility, has now passed its experimental stages and is removing the limitations of intragastric visibility and overcoming most of the causes of instrumental failure. Gastroscopy can now be applied to outpatients, and gastroscopy clinics on the lines established by HAROLD EDWARDS will be essential in post-war medicine. HERMON TAYLOR'S "two-view test" for malignancy in a doubtful lesion appears to depend overmuch on an accurate hand drawing of the endoscopic appearances, but this difficulty intragastric photography will remove as soon as it becomes feasible. The value of gastroscopy is clearly demonstrated by the operability-rate of 68% in his gastroscopically diagnosed cases, for few of the resections would have been done at that early stage without its aid.

THE EXPERT'S PLACE

WHEN Dean COLET founded St. Paul's School he wrote his own Latin grammar for the boys, judging the works of others too hard for his "little beginners"; and a generation ago publishers employed experienced scholars to produce schoolbooks for infants. This is a sound principle, for only the expert knows which facts are fundamental and how to present them stripped of confusing detail. In medicine elementary textbooks are too often written by struggling registrars seeking, if not for profit, to make a name, and with few exceptions nobody bothers with such trivialities once he has established himself. But there is no more worthy task for the wise and experienced than writing such books, since the teaching the student receives in the elements of medicine may make or mar him; not only his knowledge but his attitude to knowledge, and thus his future value as a scientist, depends on it. Similarly in the practice of medicine it is too often assumed that the hallmark of the expert lies more in his ability to treat gross disease than in his skill at managing its beginnings; this is one of the factors which makes preventive medicine an unpopular career to many of our best students. The beginnings of disease are notoriously the most difficult to diagnose, yet their recognition offers the greatest prospect of lasting benefit to the patient. It is unfortunate that in some hospitals the treatment of outpatients falls to junior members of the staff. This arrangement often means that teachers have little opportunity of treating disease in its earlier and more curable forms, and that students are deprived of intensive teaching by the leaders of the profession on disease in the guise which they will most commonly encounter in practice. SHIRLAW [1] has urged the application of the same principle in the treatment of casualties by placing their classification in really skilled hands. Accurate classification is probably the most important step in the whole casualty service, for on it depends not only the appropriate treatment but the conservation of resources at a time when that may be vital. In these days of pressure on hospital beds an expert should determine which casualty ought to be admitted to hospital and to a particular type of hospital treatment, which is the one for immediate operation, which for preliminary resuscitation, and which for evacuation or return home. To make such decisions may be far from easy, especially with patients who have just passed through a terrifying experience. A senior member of the profession may be more useful doing the preliminary sorting of these cases than operating in the theatre. This does not require the creation of yet another race of specialists, for there is no reason why the senior members of a unit should not take turns at classification. The aim is to place our best men where their skill can be used to the best advantage, and used early.

1. Shirlaw, G. B. *Lancet*, 1940, **2**, 599.

The Index and title-page to Vol. II, 1940, which was completed with the issue of Dec. 28, will be ready shortly. A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now.

Annotations

THE CHILD WITH BRAINS TO SPARE

EVERY nursemaid knows that boredom can make a devil of a child. And though she may not call this phenomenon a behaviour disorder of intellectual origin, she knows well enough how to treat it. She finds the child something to do. If his boredom goes long unrecognised a child may be driven to take a strong line with his environment; the treatment, however, remains the same. This is well illustrated in a series of 7 cases, reported by M. W. Thorner and G. H. J. Pearson,[1] of children between the ages of four and sixteen, in all of whom a high intelligence was getting too little to bite on. In every case the mental age was well in advance of the chronological age, in one boy by as much as six years. His behaviour disorder had taken the form of sex delinquencies, for which he had been expelled from school; actually, bored by the juvenile prattle of his contemporaries, he had sought the society of older boys and his rôle had been a passive one in the sexual activities which followed. He was found to be a good draughtsman, drawing lessons were arranged for him and he was sent to high school. All this was settled in four interviews, and ten months later he was doing exceptionally well both in drawing and at school. The other cases showed a similar sequence; one aggressive girl of four with a mental age of seven settled down as soon as she was sent to school and allowed to use her ability; another girl of sixteen with a mental age of eighteen was continually thwarted by a stupid mother who dressed and treated her as a child of thirteen. Her plan to get to college was encouraged and she continues to do well, to the perplexity and slight annoyance of her mother. Such children are probably not rare and it is as much the job of the teacher to see that the intelligent child gets his chance as to ensure that the dullard is not pressed beyond his capacity. If these simple adjustments are not made early the child will probably reach the child-guidance clinic, and though the necessary chance can then be made for him, he will have lost useful time and been through experiences in which he has been not only tried but trying.

COMPLEMENT-FIXATION TEST IN CEREBROSPINAL FEVER

SINCE the introduction of chemotherapy, bacteriological confirmation of the diagnosis of meningococcal disease has become much less common, owing to the rapid action of the sulphonamides. Thus the indirect detection of the infecting agent by finding specific antibodies in the blood has a greater value in diagnosis now than it would have done in the past. Maegraith[2] introduced his precipitation or contact test, using a precipitating antiserum with the centrifuged spinal fluid. Cruickshank[3] failed to obtain many positive readings with this test and thinks that a specially prepared precipitating serum is needed for satisfactory results. In his hands the agglutinin and opsonin tests have not been satisfactory either. He now submits a progress report on the complement-fixation test in meningococcal disease in the hope that others will be stimulated to pursue it during the present winter and spring when material is likely to be abundant. The evidence so far suggests that it may be a useful diagnostic test in the second week of meningitis. From 30 patients with meningococcal infection 43 samples of sera were examined, 17 in the first week of disease, 13 in the second week and 13 in the third week. If we count 7 doubtful reactions as negative, and 12 weak positives as positive, the following facts emerge: in the first week there were 6 negative and 11 positive results; in the second week 2 negative and 11 positive results; in the third to seventh week 6 negative and 7 positive results. Thus there is an apparent shift to positivity during the second week of infection. It cannot be said that a strong case for the test has yet been made out. The number of cases examined is too small to be significant and examination of a larger series may well reveal a higher proportion of negatives in the second week. Even with chemotherapy the cases bacteriologically unconfirmed are chiefly those in which organisms in the spinal fluid or blood are few; and, because of this, it seems probable that in such cases antibody production will be least. Again, the result may largely depend on the nature of the antigen employed by any particular worker; Cruickshank used a mixture of a freshly isolated group 1 and a type 3 strain. Like so many other laboratory tests the negative result cannot be relied on, and only the positive is of value. As we may have to wait until the second week for a positive result, the test will not influence treatment. Fortunately this does not matter in most cases, as long as sulphapyridine, and probably sulphathiazole, are given early, for these drugs are effective alike against the meningococcus, streptococcus and pneumococcus. The test may sometimes help to decide whether a bacteriologically unconfirmed meningitis associated with an otitis media or chronic otorrhœa is streptococcal (derived from the ear infection) or meningococcal in origin, although the information is likely to be obtained too late to influence a decision to operate. In spite of these disadvantages the possibilities of this test are worth exploring.

1. *Amer. J. Dis. Child.* 1940, **60**, 1245.
2. Maegraith, B. G. *Lancet*, 1935, **1**, 545.
3. Cruickshank, R. *J. Path. Bact.* January, 1941, p. 142.

BIRTHPLACE OF LISTERISM

GLASGOW Royal Infirmary is one of the great voluntary hospitals of Britain. The fame and reputation of a voluntary hospital depend in the main on its power to attract students to its teaching school, which in turn depends on the ideals and spirit of its teachers and the broadmindedness of its lay governors. In a series of short sketches[1]—he disclaims the title of history—Mr. John Patrick, F.R.F.P.S., has given an engaging account of the fortunes of the infirmary during its life of a hundred and fifty years. The articles were first written for a magazine published by Messrs. Colvilles, benefactors of the infirmary, with the aim of giving readers some knowledge of the institution they were supporting; now Messrs. Colvilles have reprinted them for wider circulation on behalf of the court of directors of the infirmary.

From the outset the lay governors and medical staff of the infirmary and the citizens of Glasgow were united in the desire to build, not merely in stone but in spirit, a worthy institution. So well did they succeed that 40 years later Dr. Moses Steven Buchanan, the first historian of the infirmary, was justified in asserting, a little magniloquently, that "it was well calculated to serve as a model for other institutions of the same nature," and he goes on, "in consequence of the late regulations of the Court of Directors in regard to the courses of Clinical Medicine and Surgery which must be delivered regularly to the attending pupils by all the representative Physicians and Surgeons, it claims a decided superiority over every other institution in the Empire." This statement is remarkable for two points—one historical and the other merely verbal. Historically it was written about the time when the London schools of medicine were disturbed by the attempts (stigmatised at the time by THE LANCET as examples of gross nepotism) to confine the holding of lecturerships to certain favoured gentlemen; to throw open the privilege of lecturing to all the members of the staff was such a contrasting gesture that Dr. Buchanan's boast is all but legitimate. The verbal point is that it is

1. A Short History of Glasgow Royal Infirmary, printed for Glasgow Royal Infirmary by David J. Clark Ltd.

a very early example of the use of the word "Empire" to describe Great Britain's holdings in the world, a usage which did not become common for at least another thirty years. It was just at the mid-point of the infirmary's history that Joseph Lister came on the scene. Lister was on the surgical staff from 1861 to 1869. Hospital gangrene was still the dread and misery of surgeons; even Sir James Simpson suggested that surgery should be carried out in small huts holding only two or three patients and scattered over wide areas, and that the huts should be demolished and rebuilt every few years. The infirmary saw the early trials and final establishment of Lister's principles of antiseptic surgery. Dr. William Findlay wrote of the achievement:

> "His plan at first was crude and rough
> For germs like cats are mortal teugh
> Their thread to nick;
> But Joe he mixed the rare druschoch
> Soon did the trick."

The infirmary has been rebuilt more than once and each time has strengthened its hold on the affections of the citizens, on the devotion of its students and teachers, and on the ready and generous service of its lay board. Whatever may be the fate of the voluntary hospitals of the country in the future it is impossible to imagine that a tradition of such service and devotion should fail to keep it in the forefront of medical progress.

DANGERS OF NASAL IMMUNISATION

OUR snuff-taking forefathers knew the value of pleasurable stimuli applied to the nasal mucous membrane. The modern variant, the nasal instillation of immunising stimuli, is chiefly linked with the name of Claus Jensen.[1] There is ample evidence that toxins and toxoids are thus absorbed and do immunise, or stimulate immunity in those already immunised. Most of the work has been done with diphtheria prophylactic, but Gold in the United States (quoted by Firor[2]) has applied tetanus toxoid successfully in this way, and the nasal route has also been used for introducing pertussis antigen. As Jensen remarked, a considerable number of children fail to return for the second or third injection of diphtheria prophylactic; if the mother in the home could easily apply prophylactic effectively and harmlessly by the nasal route, a considerable advance in voluntary immunisation would be achieved. When the procedure was first introduced caution suggested reservation of judgment, for the method gave no control over the amount of antigen absorbed, and it seemed possible that direct application to the mucous membrane might engender trouble in the sinuses, or what would be just as irksome to the public-health administrative, a belief among the public that fortuitous infections were caused by the nasal application.

Fraser and his colleagues[3] in Toronto applied pledgets of cotton-wool well soaked with diphtheria toxoid and obtained good immunity, but were disappointed that there was a proportion of failures in re-immunisation. Jensen was little troubled by reactions. Bousfield[4] varied Jensen's directions by using a fine spray. Of seven volunteers, one experienced disabling shortness of breath and was therefore excluded after the first spraying. Of the remaining six, four suffered uncomfortable reactions after the second spraying, two being confined to bed the next day, one with vomiting. Since 1935 all probationary nurses in the mental hospitals of Copenhagen have received a subcutaneous injection of toxoid, followed after an interval by three successive nasal applications of toxoid. In 1938 Anderson[5] noticed that an unusual number of nurses needed treatment for rhinitis. Of 236 nurses examined, 152 showed no symptoms reasonably attributable to the instillations; 84 traced their nasal troubles to the instillations, in 71 the affection having begun immediately after the treatment, and in 13 a few weeks afterwards; 38 suffered from a temporary disturbance only, but 46 showed chronic crust formation, small hæmorrhages, coryza and sinusitis. Anderson was not inclined entirely to exculpate the Jensen procedure. Obviously further information is needed but it seems that nasal immunisation is not to be taken in hand lightly.

1. *Proc. R. Soc. Med.* 1937, **30**, 1117.
2. *Amer. J. Surg.* 1939, **46**, 450.
3. *Canad. J. Publ. Hlth*, 1940, **31**, 376.
4. *Lancet*, 1938, **1**, 491.
5. *Ugeskr. Laeg.* 1939, **101**, 779.

ANIMAL PARASITES IN THE ORBIT

THE damage which animal parasites in Egypt do in the orbit has been well illustrated by M.A. Kamel[1] in a discussion of the "fly-blown orbit," the result of the burrowing of fly larvæ, nearly always of the species *Wohlfahrtia magnifica*. The infection must be common, for there exists in Egypt a recognised class of maggot extractors, women whose work ensures that the infection does not ordinarily come to the notice of medical men, and yet larvæ from 32 cases were sent to the Memorial Ophthalmic Laboratory, Cairo, for identification from places in the Nile Delta in 1939. The incidence is mainly limited to July, August and September and to children under six years. It seems that if a child with the prevailing conjunctivitis has a discharge which smells this attracts the ordinary house fly to feed and the wohlfahrtia to posit larvæ. These burrow till only their spiracles are left exposed at the base of the ulcer they form, yet, though they cannot go deeper without asphyxia and death, as many as 80 have been found in one orbit. The foul discharge they cause may be pent in a cavity, producing exophthalmos, chemosis and a high temperature, and, particularly in children, there may be penetration of the sclera with panophthalmitis making evisceration imperative.

Parasitism by sparganum, the larvæ of diphyllobothriid tapeworms, is found in the Far East, and in the Tonking delta has been seen in the orbit 14 times in nine months by Joyeux and his colleagues.[2] The real intermediate host is the tree frog *Rana limnocharis*, but man has taken on that function by treating an inflamed eye with a cold poultice of an eviscerated carcase or chopped thigh muscles of this creature. The use of the frog poultice seems to have arisen either from the belief that cold-blooded frog would antagonise the heat of inflammation, or because it is locally believed that some of these inflammations are due to worms—and frogs eat worms. It is evidently a thermotaxy that causes a sparganum in the frog to migrate into the lids, orbit or adjacent parts of man. There it may produce an acute inflammation or a reaction described as histologically like that of syphilis, and which in fact yields to intravenous novarsenobenzol. Cornet,[3] however, thinks this treatment is tedious and advises surgical interference at once if the parasite is superficial but, if it is deeper, delayed until the application of heat has brought it to the surface. Alternatively the parasite may be injected with alcohol as it lies deep in the orbit.

1. Thirteenth annual report of the Memorial Ophthalmic Laboratory, Cairo, 1940.
2. Joyeux, B., Truong-cam-Cong and Nguyen-xuan-Nguyen, *Rec. med. franç. ext. Orient*, 1939, **24**, 27.
3. Cornet, E. *Ibid*, 1938, **16**, 151.

COLD FEET

LITERAL cold feet are common enough in winter in England however small we may think the incidence of the moral variety. Those who blame nature for isolating our extremities at the end of a length of shank, and thus exposing them to the refrigerating properties of snow, slush and floor draughts, will be glad to hear the arrangement has points. Sheard and Williams[4] have lately shown that the feet play a major part in the fine regulation of body heat. The physics of temperature regulation has been closely studied by American workers

4. Sheard, C. and Williams, M. *Proc. Mayo Clin.* 1940, **15**, 758.

since J. D. Hardy, several years ago, perfected a convenient instrument for measuring body heat. Some of their findings have already been noticed in our columns,[5] notably their observation that the skin, whatever its colour, radiates in the relatively long infrared range, acting as a perfect "black body." Burton, reviewing recent developments,[6] remarks that since it has been possible to measure accurately the quantities of heat lost by conduction, radiation and evaporation, it has been shown that more than half the total heat loss of the body is accounted for by radiation. Thus air temperature and humidity are not the only factors relating the body to its thermal environment: owing to radiation, the temperature of such things as walls and windows affect it. Sheard and Williams have concentrated on the regional loss from various parts of the body surface, and have found the extremities, particularly the feet, to be the most active at ordinary temperatures. From this they argue that, environmental conditions being equal, people with a high basal metabolic rate and therefore more heat to lose should have warmer feet than those with a lower B.M.R. In 6 subjects with rates ranging from normal to − 14% this was found to be true, thermocouples on 19 regions of the body failing to show any correlation between skin temperature and B.M.R. except on the toes, where it was definite. The order of difference was 1° C. for each Calorie per sq. m. per hour of B.M.R. Working with Kirklin and Plummer,[7] Sheard has found that the same principle holds in exophthalmic goitre—the increased B.M.R. is accompanied by a rise of temperature in the feet. The patients, indeed, are aware of this without any measurements and tend to stick their feet out of bed. There is a definite fall in the temperature of the toes after partial thyroidectomy. Skin temperature being determined chiefly by blood flow, Sheard and Williams suggest that B.M.R., toe temperature and vasomotor control ought to be correlated under conditions known to influence one or other of these factors. In the more homely sphere, the observations seem to provide scientific backing for the old-established connexion between winter chills and cold feet.

MALARIA IN CEYLON

MALARIA still remains a living danger in Ceylon. Vast regions of the island are jungle bound, where once there were thriving cities. The south and west lowlands and the central mountains are healthy country, receiving ample rainfall from the south-west monsoon. There the people live among gardens, fruit trees, flowering shrubs and rice fields. The north and west were once as wholesome and gracious; the cities of the Singhalese, with their great irrigation tanks, were the homes of a rich and cultured people. The Tamils drove them out, and left them to straggle back as a helpless remnant, unable to recover their prosperity. Malaria had taken hold on this region, and proved a more enduring invader than the Tamils; the great water tanks buried in jungle are now considered to be the permanent breeding places of mosquitoes. When, however, there is a drought in the south, malaria spreads outward from this fastness. The big rivers, especially the Mahaweli Ganga, dry up at their source, and pools remaining in the rocky bed form ideal breeding grounds for anopheles mosquitoes. The crops fail for want of water, the people are weak from famine and sickness and the death-rate in such epidemics is high.

In 1939 the conditions of the last great epidemic of 1934–35 were created afresh. The monsoon failed and rainfall was well below the average in all the catchment areas, the Matara district suffering the worst deficiency. Armed with these salient facts culled from previous and hard-won experience, the report of the director of medical and sanitary service is of special interest. It shows that hospital cases during 1939 numbered 107,345, while 3,103,450 were treated at the outpatient departments of hospitals and dispensaries. There were 2677 deaths during the year, being a fatality of 2%, slightly less than that of the 1934–35 epidemic. The considerable epidemic of 1939, beginning in April and lasting up to August, extended over a slightly larger area than that affected in 1934–35. The spleen rates of 1936 and 1937 were high, but in 1938 a downward trend was observed over the epidemic zone in the island. The duration of the epidemic varied from 131 to 163 days in different areas. It was met by well-organised measures, based on the experience gained in 1934–35, and it found the island well covered by trained personnel. Timely notice of the advancing epidemic made it possible to marshal all the resources and labour necessary, and temporary hospitals were opened at Alawwa, Rambukkana, Hewadiwela, Mawanella and Dedigama. These measures were aided by antilarval operations and destruction of adult mosquitoes. A total of 21,690 films examined gave a distribution of 21% for benign tertian, 28% for subtertian and 51% for quartan. The parasite rates were highest in the dry zone and lowest in the wet; quartan predominated in the intermediate and dry, while benign tertian dominated the wet zone.

Of 9785 *Anopheles culicifacies* dissected, 154 were found infected with oöcysts. Infections with malaria were found in this well-known species only and it has been well established that it is the main carrier on the island.

CHLORATE OF POTASH FOR POLIOMYELITIS

DURING the past two years there have been favourable reports, on the Continent, of the use of potassium chlorate in acute anterior poliomyelitis. The drug won such plaudits that Gsell[1] gave it to 97 patients in the 1939 epidemic in Switzerland. He has compared the results with those obtained with non-specific therapy in 22 cases from the same epidemic, and in 170 cases encountered in the previous three years. There did not seem to be much spontaneous variation in the form of the disease during that time. His figures showed no advantage in survival or freedom from residual paralysis for patients treated with potassium chlorate, although it was given early (half the patients were admitted to hospital in the preparalytic stage) and in very large amounts (0·1 g. per kg. per day, with the nasal installation of 2% potassium chlorate four times a day in addition). The statistical evaluation of results in poliomyelitis is difficult, so Gsell also studies individual case-histories in order to answer the following questions. Can the drug arrest the most severe form of the infection, in which there is an ascending paralysis? If it is given in the preparalytic stage, will it prevent paralysis? Does it cure poliomyelitic meningitis? Does it, as has been claimed, even reduce the duration of pyrexia? Disappointingly, the answer was no every time.

Sir WILLIAM HORROCKS, who died on Jan. 26 at Hersham, Surrey, at the age of 81 spent his life in and for the Army medical service. As teacher, editor and investigator alike he won lasting fame; he was a member of the Royal Society commission whose discovery of the goat as the vector of *Micrococcus melitensis* was turned to such good purpose that Malta fever became a misnomer. At the end of the last war he became director of hygiene at the War Office and was appointed K.C.M.G.

Sir GEORGE STANISTREET who died at Bournemouth on the same day in his 75th year was responsible for medical and surgical supplies during the last war. He became major-general in 1918 and was appointed K.B.E. four years later.

5. *Lancet*, 1929, **2**, 988.
6. Burton, A. C. *Ann. Rev. Physiol.* 1939, **1**, 109.
7. Kirklin, O. L., Plummer, W. A. and Sheard, *Proc. Mayo Clin.* 1940, **15**, 774.

1. Gsell, O. *Schweiz. med. Wschr.* Aug. 24, 1940, p. 803.

Special Articles

POST-WAR HOSPITAL POLICY

THE NUFFIELD PROVINCIAL HOSPITAL TRUST AT WORK

BY SIR E. FARQUHAR BUZZARD, Bt., K.C.V.O., D.M. Oxfd
CHAIRMAN OF THE MEDICAL ADVISORY COUNCIL OF THE TRUST

IN view of the letter which the Minister of Health addressed to the chairman of the Nuffield Provincial Hospitals Trust which was published by the lay press on Jan. 15, the time appears to be opportune for some description of the work already carried out during the last twelve months in developing the trust's scheme for the regionalisation of hospital and medical services and for some indication of the implications contained in such a scheme for the provincial hospitals, the community and the medical profession.

In the letter referred to above the Minister states that he is convinced that some form of regional unit will be necessary to make the best use of our existing hospital accommodation and expresses his desire to find the right relation between the local authorities on the one hand and the voluntary hospitals on the other. This has confirmed the trustees in their view that hospital organisation in the future will be based on regional units.

POLICY OF THE TRUST

This may be briefly described as follows :—

(*a*) to divide the country into a number of *regions* with the object of establishing in each an organisation of hospital and health services through a regional council representing the voluntary hospitals and local authorities within the region. It is intended that a hospital or group of hospitals associated with a university medical school should be the regional centre whenever possible and the region should be subdivided into two, three or more *divisions* based on a " key " hospital, each with a divisional hospitals council appointing representatives upon the regional council,

(*b*) to give financial aid to the initiation and support of these regional councils, and

(*c*) to allot, on application, to such regional or divisional councils, sums of money for the promotion of hospital and health services, medical research and teaching which, in the opinion of the regional council, are necessary to meet the needs of the population in the region. (Such grants will not ordinarily be made to individual hospitals otherwise than through regional and divisional hospitals councils. Similarly a number of local authorities are already making contributions under section 181 (3) of the Public Health Act 1936 to such councils.)

PROGRESS TO DATE

Despite war conditions progress has been made in implementing the policy of regionalisation outlined above. There has been an encouraging response on the part of local authorities, notably in the larger industrial areas. There is, on the part of voluntary hospitals generally, an increasing recognition of the desirability of the coördination of all hospital services. The medical profession, furthermore, is actively interested and is taking part in creating regional medical advisory committees. This statement is based upon visits which I have paid to such centres as Edinburgh, Newcastle, Liverpool, Manchester, Leeds, Sheffield, Cambridge, Bristol and Plymouth, in all of which places regional schemes are in various stages of development.

During the past year regional hospitals councils have been constituted in three different parts of the country: in Berks, Bucks and Oxon, in the South-Western region (Devon and Cornwall) and in the North-Eastern region (comprising Northumberland, Durham and parts of the North Riding of Yorkshire). Regional medical advisory committees have been constituted in each of these regions and in Scotland. The following examples may be cited of the activities already being undertaken by one or more of these regional councils or by the divisional councils comprised in them.

(*a*) Survey of hospital services on a regional or divisional basis with the object of preparing a comprehensive report on the existence of duplication or overlapping or the necessity for the development of new services or the extension of services already available.

(*b*) Organisation of a system of transfer of patients from the " key " hospital to other hospitals within the division after operation or for the continuation of treatment. The result of this arrangement is to reduce the period of occupation of beds in the " key " hospital, thus freeing these beds for other patients requiring such specialist treatment as is unobtainable in other hospitals in the division. It is hoped that this system will reduce waiting-lists and thus be of great benefit to the community.

(*c*) Organisation of divisional blood-transfusion services.

(*d*) Organisation of a divisional system of ear nose and throat clinics. This arrangement is intended to provide a system of clinics in a number of district hospitals in affiliation to the ear, nose and throat department of the " key " hospital in the division.

(*e*) Proposals are under consideration for (i) regional or divisional accident services, (ii) regional pathological services, and in connexion with these latter proposals it is considered that a pathological service is not only urgently necessary but is peculiarly well adapted to regional organisation.

It will be clear from this brief description of the policy and the progress of the regionalisation scheme sponsored by the trust that its implications for provincial hospitals, the community and the medical profession are manifold and far-reaching and it may be well to indicate in greater detail some of the changes that these implications may involve.

IMPLICATIONS OF THE POLICY

During recent years, there has been a rapidly spreading tendency on the part of the public to seek help from hospitals in time of sickness or injury, and practically all classes now expect such help in return for smaller or larger payments or contributions. The reasons for this change are easily exposed. With the advance of medical knowledge methods of diagnosis and treatment have become so much more expensive and so much more specialised that many of them are not readily available except in institutions. Moreover, social and domestic conditions have altered with the result that many households are unable to stand the strain of long illnesses and skilled nursing at home. Regional councils will need to face this problem, recognising that it will grow rather than dwindle in the future and that hospital development must provide for the accommodation of patients varying over a wide income range.

This increase in the scope and utility of hospital work has many repercussions. It is essential, on economic grounds, to centralise the more expensive and more specia ised methods of investigation and treatment in the larger hospitals, and at the same time to make them accessible, in case of need, to every doctor and patient within the region. The solution of this dual problem is an implicit obligation laid on regional councils and one which must involve some radical changes in hospital organisation and in the economic position of the medical profession.

The key hospital.—Regions cover wide areas containing populations which vary in size and, under the scheme envisaged, are broken up into two or more divisions in accordance with the distribution of the hospitals and of the population within the region. The primary or key hospital or group of hospitals of the region, as has been stated already, should, if possible, be one connected with a medical school, staffed and equipped to undertake all general and special hospital work and capable of offering both advisory and practical assistance to institutions within the region less completely provisioned. The key hospital of the region will naturally be the key hospital of the division in which it lies. The key hospital of other divisions should generally be a large non-teaching hospital which again should be linked to the smaller hospitals of the division by means of organised services. There should also be the system of interchange of patients between key and secondary hospitals previously referred to.

The smaller hospital.—In the organisation of medical services some of the smaller or cottage hospitals without a resident medical officer present a difficult problem and the question arises not infrequently as to their utility and economic value. It is to be hoped that hospitals with less than 20 beds can be usefully included in a regionalisation scheme and be worthy of regional support if used for suitable purposes, such as ear, nose and throat, dental

and school clinics and convalescent accommodation. In many regions there are scattered about small hospitals of not more than 50 beds and without resident medical staff which should be linked up with the key hospitals by means of an understanding that they should undertake the care of patients from their neighbourhood

(i) who do not need more special skill than can be obtained locally or by visits of specialists from the centre and

(ii) who are ready to leave the key hospital and are not yet fit to return to their homes.

It can hardly be doubted that the general practitioners who staff them would welcome the addition to their number of one or more consultants paying regular visits and would readily undertake to keep adequate records of cases under their care, in conformity with a system of record-keeping adopted by the region on the advice of the medical advisory committee. Uniformity of records is important for the progress of medical science and should facilitate field research work undertaken at the centre of the region.

The *linking* of key hospitals with general hospitals of over 50 beds with one or more resident medical officers by means of a system of periodic visits by the consulting staff of the key hospital would be one method of bringing the general practitioner into closer contact with the key hospital and thus enable him to keep pace with advancing knowledge. Another step directed towards the same object would be the organisation of special services such as pathological, accident and cancer services on a regional basis.

Consultants and specialists.—The development of organised medical services has been delayed by the lack of any regional hospital scheme in the past, with the result that progress in medical knowledge and skill has outrun any measures taken for their widespread application. The distribution of consultants and specialists has been extremely unequal: in some regions there are many, even if not enough; in others very few or none. But even where there are many in a key centre they should in the future extend their activities thence to a personal share in the work of smaller hospitals where there is a shortage. The staffs of large hospitals will need to be increased if they have the responsibility of visiting outlying institutions. In some areas it may be advisable for consultants to be nominally on the staff of a key hospital but to reside in an outlying area and serve a group of small hospitals. This has been found to be an essential in the organisation of the Emergency Medical Service.

It may well be that the regionalisation scheme will ultimately involve the appointment of doctors to a region, or to a group of hospitals within a region, rather than to individual hospitals so that each member of the staff of a region may eventually carry out the work for which his abilities and experience most suit him, whether it be general consulting practice, one of the specialties, teaching or research. In these ways increments of medical knowledge may be more easily, quickly and skilfully applied to the general practice of the profession. Moreover, it may be submitted with some confidence that, with a recognition of the value of a wider distribution of specialist work, more men and women with the ability and qualifications to perform consultant and specialist services would be attracted to these branches of the profession, provided that they could depend on equitable payment from some source or another.

Municipal and voluntary hospitals.—All the changes envisaged in regard to institutional treatment for patients of all classes point to the conclusion that the voluntary hospitals no longer meet the increased medical and health needs of the population. This fact was recognised by the state in the Local Government Act of 1929 with the result that there are now more beds in the country in municipal than in voluntary hospitals. It is essential that the system of staffing all these hospitals, both municipal and voluntary, should be unified, a step which involves the remuneration of hospital medical staffs on a similar basis throughout the country as well as the measures in regard to the distribution of staff already referred to. The day of the honorary position of hospital staffs has passed and it is necessary to consider the sources from which funds can be found for their stipends.

The information which has been accumulated by the trust during the past year in regard to the emergency hospital and medical services suggests that these services would have benefited considerably had regional and divisional councils been in existence to take a prominent share in their administration. The problems of hospital service administration vary so widely in different regions that local knowledge is an invaluable and almost essential asset.

CONCLUSION

The medical profession has a great part to play in the future in the organisation of better health services. The medical advisory council of the trust is unanimous in its approval of the regionalisation scheme as a first step upon this road. The council is further in sympathy with the practice, already followed in the three regions in which hospitals councils have been constituted, of establishing regional medical advisory committees. These committees are representative of the various branches of the profession, of general and consulting practice, of specialties such as pathology and orthopædics, of teaching and research and of public health and preventive medicine. On the shoulders of these medical advisory committees will fall the responsibility of advising the regional councils in regard to the initiation or development of requisite services or, it may be, the limitation or curtailment of certain services in order to avoid wasteful overlapping or competition. The establishment of these committees is an experiment in social medicine of the first importance and there is good reason to believe that the success of the regionalisation scheme will largely depend upon their strength and activity.

MEDICAL USES OF RADIUM

To maintain the continuity of their reports on experimental research the Joint Radiological Committee of the Medical Research Council and the British Empire Cancer Campaign have published their report for 1939 in the *British Journal of Radiology* [1] instead of as their usual monograph. In an introductory note, they explain that the disorganisation of radiological treatment at the beginning of the war has made it impossible for most of the clinical centres under their direction to submit their usual statements, but it is satisfactory to find that several centres have been able to continue their investigation of the physical properties of neutrons. The physics department of the Imperial College of Science and Technology has shown that secondary neutrons were produced when uranium oxide was bombarded with slow neutrons, and are investigating the possibilities of a chain action which would cause cumulative disintegration of uranium oxide. Prof. F. L. Hopwood, D.Sc., of St. Bartholomew's Hospital and his collaborators have searched for neutrons emitted from radium and uranium during neutron bombardment without finding any. He has also, together with Prof. A. Wormall, D.Sc., and Mr. T. E. Banks begun an investigation into the use of radio sulphur as a biological indicator. This is the useful method whereby the element sulphur is rendered radio-active, becoming in the process S_{35}, a change fairly easily induced by exposure to the beam of the cyclotron, now available in the Cavendish Laboratory. The radio-activity acts as a label for these atoms because it can be detected by special instruments, and considerable light can thus be thrown on physiological processes by following radio-active atoms introduced into animals by ingestion or injection. This work is still in the preliminary stages but is certain to be of increasing importance.

The question of the distribution of dosage under ordinary conditions of clinical radiotherapy has interested Prof. W. V. Mayneord, D.Sc., of the Royal Cancer Hospital and the workers of the Radium Beam Therapy Research Centre. Prof. Mayneord has continued to use the contour projector to estimate the integral dose throughout the mass radiated. The other workers have also attacked the problem of three-dimensional distribution. The results of their investigations into the effects of matched beams of gamma and X-rays will be

1. Summary of Reports from Experimental Research Centres for 1939, *Brit. J. Radiol.* January, 1941, p. 1.

of great practical importance and the care taken to find a suitable material for the construction of condensors with characteristics independent of wave-length is a valuable contribution.

Four laboratories, the Strangeways Laboratory at Cambridge, Mount Vernon Hospital at Northwood, the Institute of Animal Genetics of Edinburgh University, and the Barnato Joel Laboratories of the Middlesex Hospital, have continued experimental research on the biological effects of radiation. At the first, Dr. F. G. Spear reports new work on the reactions of human tumour cells, which are compared with those of cells in tissue culture, of normal cells in vivo and of embryonic cells during development. Experiments on the significance of the wave-length factor by Mr. I. Lasnitzki and Mr. D. E. Lea, Ph.D., of this laboratory using tissue-cultures and chick embryos show a higher efficiency of medium and soft X rays as compared with gamma rays. Their results should be examined in relation to a similar experiment by Dr. J. C. Mottram and Mr. L. H. Gray, Ph.D., who radiated the tails of mice and point out that although a dose may be constant for radiation of different wave-lengths, it does not follow that the amounts of energy released are identical. This observation has led to some very interesting experiments on the ionising power of secondary electrons from atoms which may normally be present in living tissue. Sulphur was found to increase the secondary emission from two qualities of X radiation, 190 kV and 117 kV. Again the comparison is with gamma radiation.

Mr. H. J. Müller, Ph.D., uses gene mutation and translocation, structural changes produced in the chromosomes of the mature male germ cells of the drosophila, as his indicator. His work relating to mutations from a single ionisation has now reached a point where he can say that this effect is approximately proportional to the dose received, even if this is fractionated and prolonged over long periods. The importance of this to all whose work exposes them to penetrating radiation is obvious. His maximal effect is produced by raying the mature spermatozoa because translocations are also important at this stage, but genes being the unit for inheritance total hereditary effect depends on the total dose received by the individual throughout the whole length of life.

The work done by Prof. Sidney Russ, D.Sc., and Miss G. M. Scott is always practical, and the negative finding that the effects produced by radon do not differ essentially from those produced by radium is important at a time when the use of radon offers protection against the risk of radium being dispersed by enemy action. The biological effect of neutron radiation is as important as the physical properties, and investigation of the biological effects from neutrons and the relative effect of neutrons and gamma rays of mouse tumours has been undertaken. The investigators conclude that if tumours are damaged by neutrons through the reaction of a single recoil proton new factors come into consideration which may prove of value in cancer therapy.

SCOTLAND

WAITING-LISTS

A FURTHER step has been taken in the reduction of the waiting-lists of voluntary hospitals. Agreement has been reached between the Department of Health for Scotland and the British Hospitals Association (Scottish section) and beds are to be made available in the emergency hospitals and annexes for the treatment of ordinary civilians who would normally be admitted to voluntary hospitals. The voluntary hospitals will continue to admit patients in the ordinary way but may nominate patients whom they cannot admit quickly for admission to the appropriate casualty hospital. Preference will be given to patients engaged on work of national importance whose restoration to full health would be of national value. They will be treated in the casualty hospitals free but the voluntary hospital from which they come will make a small payment for each to cover food, drugs and dressings.

POLISH MEDICAL FACULTY IN EDINBURGH

The Polish government have accepted the offer of the University of Edinburgh to set up a Polish medical faculty. Many Polish medical officers have felt the need for postgraduate refresher study and there are in the Polish forces in this country a large number of men whose medical studies in their own country were interrupted by the war and who now wish to complete them. There are enough Polish professors and lecturers in this country to form a teaching faculty with the help of the university departments. Language difficulties make it desirable for Polish students to be taught by Polish teachers wherever possible. Arrangements are not yet complete, but in the meantime a beginning is to be made by attaching Polish graduates to some departments for postgraduate work. The provision of teaching beds in a central situation is one of the important problems which remain to be settled.

In England Now

A Running Commentary by Peripatetic Correspondents

I WAS travelling in a tramcar in a midland industrial town at the rush-hour when streams of workers were pouring out of the factories. Beside me was a young workman who looked pale and tired. He yawned and I said to him, "Are you still working long hours?" He shrugged his shoulders, looked at me suspiciously and grunted, "Yes." "How are you standing up to it?" "Takes it out of you," he said. "I've lost two stone in weight since the war started." "Why do you think you've lost weight?" "Because I know I have," said he truculently. "Yes," I said, "but what do you think is the cause of it?" "Because we work every day of the week and get no chance to recover." "Do you eat well and get enough to eat?" "Yes," he said. "I take sixteen sandwiches and eat them during the shift. If you don't eat a lot you can't stand the work." And then musingly, "You've got to look after yourself when working these hours; otherwise you'd crack up; it's a case of work and sleep and work again; get's a bit dull, but we can stand it, specially young men like me; it's the old chaps I'm sorry for—they're completely done in towards the end of the twelve-hour shift, and we've got to finish off for them, poor blighters. Pity they can't get lighter jobs." "Is yours a heavy job?" I persisted. "Yes." "What do you actually do?" "Aircraft," he said, in a tone that forbade any further reference to the matter. I got out of the tram with a "good luck" to him, and I daresay he didn't notice that I metaphorically raised my hat.

* * *

I once had a colleague who said that if he ever wrote a detective novel, he would call it "The Patient in Bed 17." In spite of the criminal apparatus (poisons, corpses, mortuaries, anæsthetics, knives, lunatics and doctors) to be found in this hospital, crime has not yet risen above the level of the recurrent petty thief who steals ten shillings from the coat the surgeon has left hanging in the anæsthetic room.

When I heard that most of the children had suddenly developed diarrhœa I looked forward to some happy hours of detection. Armed with pencil and paper, I assumed the personality of Colonel Wimsey Thorndyke, the famous hospital sleuth who has brought so many villains from the Salpêtrière to the Sûreté, and set out. I found myself somewhat late on the scene, the incident had occurred three days before and was considered to be closed. Rather damped, I went more slowly to work. The outbreak had the explosive character of an epidemic due to food or drink. Water and milk were readily excluded by the peculiarly local distribution of the cases. Soldiers, civilian sick, maternity patients and staff were not affected. Nor were infants who were on a diet of milk only. The sister of one ward was positive that the minced meat was to blame, another felt equally strongly that one should never trust a German sausage. Inquiry showed that many children who had sausage did not have diarrhœa, and many who had diarrhœa did not have sausage. The meat (slices of boiled mutton) had upset no-one, but every child but one of those who had diarrhœa had eaten similar meat minced. The one exception had developed tonsillitis at the same time that she had diarrhœa.

In a good thriller a murderer never strikes only once. Imagine, Poirot, my consternation, on arrival at the

hospital on the following day, to find that the occurrence had been repeated. Forty-four innocent children had been stricken in the night. All had had mince, while most of their happy confreres had not. Furthermore, three old women in one ward were also affected and they were the only adults to prefer minced beef to beef cut off the joint. The time for unmasking was near. I approached the cook and demanded to be shown the mincer. He told me that meat was cut off one of the joints, minced and put in a warm oven until it was sent to the wards. The mincer was cleaned by pouring hot water through it. "Who cleans it?" "Jack" (a mentally defective inmate). "Ah! Take the mincer to pieces." The blades, the disc, the worm, were spotlessly clean. Saddened, I was turning away, but in a last effort I produced a speculum and inserted it into the mouthpiece of the machine. The little circle of light travelled back and forth and revealed in the depths a pallid heap of yesterday's mince. With a flash of triumph I turned round, but Dr. Watson had gone off to see a Canadian who had fallen from his motor bike. So, taking a pinch of cocaine and tucking my violin under my chin, I started to write this little monograph.

* * *

The war is responsible for a lot of trouble, but not for everything that goes wrong. Today, for instance, all sorts of people are holding up their hands in horror at what they call "the great increase in juvenile crime." Technically, of course, there is no such thing as juvenile *crime*, the authorities having decided that the anti-social activities of the young shall be camouflaged as "juvenile delinquency." It doesn't much matter. The fact remains that the charge sheets in the juvenile courts are longer and fuller than they were, and there does seem to be an increase in the number of serious offences. It is desirable, however, before jumping at any conclusion, to analyse the cases. If this be done, it will be found that a large proportion are no more than the outcome of thoughtless mischief. The three small boys who stole from a shop a card attached to which were a dozen twopenny bottles of hair oil were naughty, but they can have had no really criminal intent. The bottles of hair oil were of no use to them; they certainly had no notion of employing them for any æsthetic purpose. Their heads, after their raid upon the shop, were as untidy as they had been before. Having got hold of the little bottles all they did was smash them against a wall, one by one. This no doubt was satisfying, but not criminal. Their act was one of sheer mischief. So with the boys who took a great deal of trouble over rifling a box on a lorry and found their booty was quite uninteresting—to them. It was a shaving set, most of which they threw away. Recently a number of cases have come before one juvenile court, each exactly like the last. Three or four small boys have appeared, and all of them have admitted taking from unattended buses packets of bus-tickets. No satisfactory explanation has so far been forthcoming. It is not easy to see what can be the charm of bus-tickets, which carry no pictures, and are not even coloured. A school attendance officer suggested that they may be taking the place of cigarette cards, now no longer obtainable. This was reported in the local newspaper, and a man, for many years bedridden, was scornful. He explained that when he was a boy a mysterious sort of gambling game was played with disused bus-tickets, the basis being the numbers printed on them. But he went on to explain that tickets arranged in sequence (as were the stolen ones) were of no use. He rubbed his head and began to think again. The fact of the cases under consideration was that the small boys, having got hold of the tickets, promptly lost them or threw them away. In short, the entire business consisted in the fun to be got from outwitting the bus people. That, probably, is the explanation of quite a lot of juvenile delinquency. The small boys steal, not so much with the hope of gain, as for the sport of the thing: just as their elders go off big-game hunting—merely for the thrill.

Bigger boys offer a much more serious problem. Why, for instance, should two boys of 16, both looking more like 20, smash a whole series of plate-glass windows? Within a couple of weeks they did more than a hundred pounds' worth of damage. All they had to say was that they were sorry. Both were in regular work earning good wages; both came from comfortable homes; neither showed any sign of a grievance against society. Was this, again, merely an example of thoughtless mischief? It looked like it, but if so it was a very serious form of mischief. They were technically "young persons," but actually were young men, earning wages which not so long ago would have been considered ample by men of mature age. And that raises a question which is causing a good deal of perplexity in many directions. Are wages paid to lads too big? Almost certainly they are. Many lads are picking up so much money, of whose value they have little knowledge, that they are developing quite irresponsible habits. They will throw up a job for the flimsiest possible reason, knowing that they can get another just so soon as they feel inclined. That is bad for them and for everybody else. It engenders that spirit of selfishness which is responsible for so many of our present discontents.

There remain, however, a great many cases of what, in older people, would be called crime. Stealing seems to be on the increase, often accompanied by breaking and entering. Lock-up shops are a common prey and, it must be admitted, an easy one. The actual amount of loss is considerable. It is aggravated by the fact that a good deal of wilful damage is often done, as by the boys who lighted several fires before leaving. Fortunately they all went out. Some other boys, not content with getting off with a lot of consumable stuff, scattered and trampled on a number of cartons of cheese and other foodstuffs. In these cases lust for gain seemed to be combined with a spirit of mischief. Today, it must be admitted, poverty is seldom if ever offered as an excuse. A big proportion of the erring boys come from comfortable homes in which there is no lack of anything in reason.

What is to be done about it? Some magistrates are falling back upon the old method (largely out of fashion now) of ordering a judicial beating. But is that wise? It must be remembered that a judicial beating can be ordered only for those under 14, technically children. In practice it is found that already the children have been well and truly beaten by one or other parent without, apparently, any good effect. The parents say so, quite often. And, after all, does beating serve any end except to assuage the spirit of vindictiveness which is present in most of us? Should we not, rather, ponder more deeply upon the root causes of delinquency? One, indubitably, is a widespread sense of irresponsibility, common to parents as well as children. That has its roots deep down in our modern society.

* * *

Among the chief interests of Gilbert White of Selborne was the recording and cautious interpretation of climate and weather. It is pleasant to turn to his famous book about Selborne and compare what he has to tell us of the hard winters of his time with the winter of last year and the milder but still disagreeable characteristics of the present season. For me it is particularly interesting because I happen to live within a few miles of Selborne. At the end of his book White gave what he called a summary of the weather for the twenty-five years between 1768 and 1792. He was especially concerned to record the length of the winter season, for in each year his commentary is mainly written about the weather from January to June, and he often dismisses the rest of the year with a mere sentence or two. The striking fact appears that what we call an "open" winter was then comparatively rare: in nine only of the twenty-five years was January free of frost and snow. White's hardest winter was in the January of 1776, the year when the Thames was frozen "both above and below bridge," and the snow lay deep in London streets for twenty-six days. "According to all appearances we might now have expected the continuance of this rigorous weather for weeks to come, since every night increased in severity: but behold, without any apparent cause, on Feb. 1st a thaw took place, and some rain followed before night. . . . On Feb. 2nd the thaw persisted and on the 3rd swarms of little insects were frisking and sporting in a courtyard at South Lambeth as if they had felt no frost. . . . Why the juices in the small bodies and smaller limbs of such minute beings are not frozen is a matter of curious inquiry."

From these jottings it will be gathered that in White's time really severe winters were not any more common than they are nowadays; and further, his records seem to confirm the popular notion that the South of England winter seldom begins till January, rarely lasts into February, and only exceptionally into March. One observation which he makes somewhere in one of his letters, which I cannot at the moment track down, is that severe frosts, especially if they are lasting, always follow unusual rains, and do not occur unless the ground has become thoroughly sodden. I should be curious to know if this observation has been confirmed by our modern meteorologists. It is certainly true that in this neighbourhood last November was an unusually wet month and the frosts began early and have continued long. White of course knew nothing of cyclones and anticyclones, nothing of warm and cold "fronts," but he did leave us a picture of the average climate which may serve to convince us that there has been no radical alteration in the last 150 years.

* * *

The railway station where I wait for my next train has two bookstalls, and, as I spend much of my time gazing at one or other of them, I know their wares by heart. There are the usual railway-journey magazines, the glossy shilling weeklies, the matt threepenny ones; there is an area occupied by different magazines for women, differing, at least, as to covers; there are piles of reprints, romantic, criminal, and non-fiction. But the real places of honour are given to a periodical devoted to Going About With Nothing On, the cover of which depicts two or three deliciously pneumatic nymphs gazing out over a land- or sea-scape. Copies of this magazine, besides forming a sturdy pile on their own, slop over into every available spare space on the stalls. I counted seventeen current numbers on the two bookstalls. Now what I wanted to know was: Who buys this magazine—without having it delivered by post in a plain wrapper, that is? Has anyone been observed buying it? I once bought one and read it ostentatiously from Norwich to Liverpool Street for a bet; but that, I felt, was different (and quite candidly, it wasn't worth it; I wouldn't do it again; I had thought I didn't care what strangers thought of me, but I found I had been mistaken). Besides which, that was before the war, when the magazine kept discreetly in its own pile. This present exuberance, I feel sure, is a war-time symptom. But of what? (Psychologists, R.S.V.P.) Our armed forces certainly don't fall for it. The N.C.O.s who share my third-class smoker all seem to read Penguin Shakespeares unless they are doing their trigonometry homework. Other ranks sleep or absorb a crime ration.

Well, I watched these bookstalls for four hours, with ten minutes off for tea, and nothing happened. Perhaps I looked too much like the detective at the wedding-reception. I don't know. Nobody, so to speak, even hovered. I can understand a chap's nerve failing him at the last moment, and fobbing himself off with a gardening monthly because he suddenly felt conspicuous. I once acquired an extremely dull middle volume of Proust instead of an Edgar Wallace I had promised myself, because I found the lord-lieutenant of the county—my one and only two-guinea patient—at my elbow buying the *Times* and *Blackwoods*. There was no legerdemain either; nobody slapped their other choices in a pile on top of one of these magazines, and so removed it under cover of, say, the *Hibbert Journal*. No. I watched carefully for that. At the end of my vigil, when there was a very strong rumour that one of the next trains would visit my destination, there arrived on the scene a couple of elderly subalterns. "It's the padre's birthday tomorrow," said one, "what about it?" The other whinnied encouragingly; and they proceeded to buy not only my pet magazine but a number of paper-covered novels, the jackets of which promised the gravity-removing adventures of priests finding themselves among artists, and of the dalliance of men and maidens shipwrecked on islands. Careless of all bystanders learning their intentions they bought these volumes loudly and wholeheartedly. So wholeheartedly that they neglected to buy themselves anything to read on their journey. Is that how it is done?

Letters to the Editor

PARTING OF THE WAYS IN DIET

SIR,—At the present time it looks as though the British diet may become deficient in first-class protein, iron, calcium and in most if not all of the vitamins. Of meat we obtain but 1*s.* 2*d.* worth per week—possibly 2 oz. per day; poultry, game, eggs and white fish are almost prohibitive in price, certainly so for the poor; cheese has almost vanished off the market and in places milk is still scarce for anyone but pregnant or nursing mothers and children under five. Oranges, grapefruit and lemons are extremely scarce and bananas are no longer imported. Watercress and "greens" have been damaged by the inclement weather. The British public will not eat much wholemeal bread and must wait for its fortified loaf till next May, which anyway won't contain riboflavin, nicotinic acid and pantothenic acid.

There appears to be two ways to meet the difficulty. The first is to turn over to a diet consisting predominantly of wholemeal bread, green and root vegetables, potatoes and oatmeal, with possibly a small amount of milk, cheese and meat. There is little doubt that such a diet would support adult life and provide all the vitamins except possibly D in more than satisfactory amounts and all inorganic elements needed, except calcium, almost in excess. I admit that that diet would take some eating and getting used to, and also that it would fall far short of the 37 grammes of first-class animal protein supposed to be essential for adults. But I would risk that for adults. The other way is gratefully to accept an offer from the United States to import into this country myriads of capsules containing concentrates of vitamins and the requisite inorganic elements and distribute them among the population. But do you imagine that the British public can ever be educated up to take either alternative? I do not, but I wonder if the Board of Education and the Ministry of Food are going to try and if so through what medium.

Barkley, Leicester. V. H. MOTTRAM.

THINGS TO COME

SIR,—It appears certain that the New World which is to emerge at the end of the present conflict will bring revolutionary changes in the organisation and practice of medicine. On all sides we can see the beginning of an irresistible process of nationalisation and socialism. The future of medicine lies in prevention and in no field is there greater need or scope for its application than in maternity and child welfare. The maintenance of a healthy stock is vital to the very existence of the state. Happy and healthy mothers and babies should be the first concern of the medical man of today; now is the time for all who believe that medicine can make vital contributions to the welfare of mankind to put forward their suggestions.

As an obstetrician I seek the hospitality of your columns to make the following propositions:

1. Compulsory notification of pregnancy.
2. Establishment of health centres.
3. Therapeutic abortion to be available in proper cases and with adequate safeguards.
4. Family allowances, and other means of direct encouragement to the raising of families.
5. The end of domiciliary midwifery.

Let me enlarge briefly on these points.

1. Compulsory notification may not be a popular suggestion to make to a nation fighting to defend its freedom, but I am convinced of the value of it. No-one appears to mind notifying the birth of a baby, and it is a small step to notify the expected arrival of one. It is necessary for the efficient working of all the suggestions that follow.

2. Health centres, under the contol of the M.O.H.s, would embody the present antenatal clinics and contraception clinics where they exist. Their scope should be enlarged so as to make them attractive to the young adults of both sexes and they would include gymnasia, swimming baths and rooms for lectures on hygiene including the hygiene of marriage.

3. By therapeutic abortion is not meant "easy abortion" after the manner of the Russian experiment,

but abortion in cases where the continuance of pregnancy would be more antisocial than its termination. In my own work as gynæcologist to a large mental hospital I have not hesitated to induce abortion among the inmates, and I cannot imagine any logical argument which could be sustained that it was wrong to have done so. There should be a reduction in the appalling figure of 125,000 feeble-minded children reported to the local authorities (statistics from 1931–37 show that the numbers are rising). Nor have I hesitated to induce abortion, after medical consultation, in a case of frank and fully proved rape; nor in the subjects of active tuberculosis where the tragedy of allowing the continuation of the pregnancy is seen in the Registrar-General's figures for deaths from tuberculosis in infants under 5. And more examples could be given.

4. Family allowances are really part of the larger issue of housing, unemployment, &c.—too large an issue to discuss in a letter. Something of this nature must be done to remove the present-day anomaly whereby the state is, in certain circumstances, prepared to expend 30*s.* a week to maintain an imbecile child, but only 5*s.* a week to support a healthy one.

5. Few would lament the end of domiciliary midwifery. Childbearing must be made as safe, painless and inexpensive as possible for every mother in every class of society. At a well-conducted maternity home the maternal death-rate is much below the average for the country as a whole. What has already been done in this direction here and there ought to become general.

The difficulties of making childbirth painless at the patient's home are well known to those of us who have practical experience. We know equally well that it can be safely and efficiently conducted under institutional conditions. Maternity homes should have a private wing for the more well-to-do patients, and from this source small funds could be made forthcoming to help the poorer mothers with comforts for themselves and their babies.

The House of Lords debated recently the subject of euthanasia. While this interests us all, it is more immediately profitable to concentrate effort on the problems attaching to the entry into the world of a new life, so as to ensure for it an environment more befitting than a stable or a slum.

London, W.1. EVERARD WILLIAMS.

SIR,—Dr. Amor asked how personality change can be brought about in the individual and in the mass. May I try and put it in a sentence or two. When a patient is willing to coöperate and recognises the need of change, I employ the following steps: 1. Insight and recognition as to where the change is needed. 2. Specific admission. 3. Decision to make the change. 4. Reparation where necessary. 5. Acceptance of a power which enables the change to take place. 6. Establishment and growth. A new world will be built by new men. Starting with ourselves the infectious quality of new life spreads to others. There is thus formed within the nation a living framework of disciplined, unselfish, responsible men and women who know how to work together. In such a way national renaissance could occur, positive characteristics being enhanced and weak points recognised and eradicated. This new spirit will spread from nation to nation.

St. Albans. E. E. CLAXTON.

SAVING THE PREMATURE BABY

SIR,—I was very glad to see that Dr. Collis has taken exception to the remarks of Sir Robert Hutchison on the attitude to be adopted to premature infants, and I think the majority of the profession will agree with what he says. Sir Robert's statement that "neonatal mortality is not related to poverty and no improvement in social conditions can improve it" runs quite contrary to my own experience in Aberdeen.

The common causes of neonatal deaths are faulty management of the labour and prematurity. So long as prematurity is common there will always be a high neonatal mortality, as the neonatal death-rate is directly proportional to the weight of the child at birth, even under the best conditions. In my experience prematurity amongst the prosperous section of the community is rare except where labour is induced because of pre-eclamptic toxæmia. Amongst the poor where the diet is deficient and adequate rest often impossible, premature labour is much more frequent. In Aberdeen, amongst the well-to-do, the neonatal mortality due to prematurity is 10 per 1000 as against 20 per 1000 for the rest of the city. There is not the slightest doubt, however, that skilled medical and nursing care will save many infants who would otherwise die.

Surely the solution of this enormous and important problem demands the combined efforts of all those concerned—viz., general practitioners, local authorities through their maternity and child welfare services, the pædiatrician and the obstetrician. It is therefore with some disappointment that I read in Dr. Collis's letter that "the battle with the obstetricians and the midwives has not yet been won" and references to "ammunition" and "the enemy." On this side of the water we get enough experience of such things in spheres other than that of medicine.

Aberdeen. DUGALD BAIRD.

B.M.A. MEDICAL PLANNING COMMISSION

SIR,—As younger members of the medical profession we welcome Sir Ernest Graham-Little's timely criticism of the proposed planning commission set up by the central executive committee of the B.M.A. He has pointed out the unrepresentative nature of this body, both as regards the profession as a whole and younger members in particular, many of whom by serving in H.M. Forces are divorced from civil activities.

We wish to record our grave misgivings about the commission and its purposes. This is based on a knowledge of previous actions taken by the central bodies of the B.M.A. which have already adequately been exposed in your columns. The council and central executive of the B.M.A. has long since ceased to consider, much less to represent, the views of the ordinary members, who were not informed of the proposed formation of the commission, and moreover had no voice in electing representatives. We have been presented with a fait accompli which is totalitarian in principle, and as such must be received with disfavour and distrust. Reorganisation of the medical profession must affect the general public. The central executive is therefore exceeding its functions, since in the democracy for which we are fighting Parliament is the proper body to express the policy of the people.

T. H. BOON	MARGARET M. M. MORRISON	H. L. ROSS
W. E. CHAPMAN	A. H. G. MUNRO	J. SHORT
WINIFRED M. DAWSON	T. O'SULLIVAN	J. SIMPSON
HELEN W. GEDDES	ELSIE L. PEET	G. A. SMART
T. I. GORDON	MARGARET PURDIE	J. P. SPARKS
H. J. JOHNSON	G. O. RICHARDSON	C. J. L. THURGAR
J. D. T. JONES	IAN D. RILEY	T. H. TWEEDY
D. M. LEIBERMAN	FRANK ROBERTSON	STANLEY WAY
H. G. MILLER	K. V. ROBINSON	JANE S. WEIGHTMAN.

Newcastle-upon-Tyne.

PREVENTION OF DIABETES

SIR,—I regret that a failure on my part to particularise in my letter of Jan. 4 has led Dr. Young to believe that I hold an opinion that I certainly do not. I agree with Dr. Young and with Haist, Campbell and Best (*New Engl. J. Med.* 1940, **223**, 607) that the evidence indicates that in *diabetic animals whose disease is not controlled by insulin* the ingestion of excessive amounts of carbohydrate probably exhausts, whilst restriction of carbohydrate, either by starvation or by giving fat diets, probably rests the remaining insulin-producing tissue. This I attribute to the fact that, because carbohydrate requires insulin for its disposal at adequate rates, excessive amounts of carbohydrate rapidly exhaust the limited supply of insulin in diabetic animals. In the *normal* animal, however, which possesses sufficient insulin to dispose of any reasonable amount of carbohydrate, the position is different. Here large amounts of carbohydrate appear to increase the sensitivity of the animal to insulin so that each unit of insulin becomes more effective and the strain on the pancreas is thus lightened. Similarly restriction of carbohydrate impairs sensitivity to insulin and increases the strain on the pancreas. Dr. Young is in error in attributing to me the view that the sensitivity of the tissues to insulin is impaired by a diet of fat. I have, on the contrary,

shown that fat has no influence on insulin sensitivity but that the degree of insulin sensitivity—and sugar-tolerance—is determined solely by the amount of carbohydrate in the diet; the more carbohydrate the greater the insulin sensitivity, the less carbohydrate the less the sensitivity to insulin (*Clin. Sci.* 1935–36, **2**, 67). This statement applies to normal animals, healthy men, and insulin-sensitive diabetics whose disease is fully controlled. It does not apply to insulin-insensitive diabetics even when their disease is controlled. In them administration of carbohydrate increases the need for insulin (*Clin. Sci.* 1939, **4**, 153) and in them the diets advocated by Petren, which contain little carbohydrate, produce excellent results.

My objection to the paper by Haist, Campbell and Best is mainly concerned with their interpretation of the experiments on normal animals. They conclude that in normal animals high carbohydrate diets increase, whilst starvation, high fat diets and insulin rest the insulin-producing tissue. In my opinion their experiments are capable of exactly the opposite interpretation. In consequence their suggestion that, to prevent the development of diabetes in predisposed subjects, the children of diabetic parents should be subjected to periods of starvation, prophylactic administration of insulin and high fat diets, appears to me to be more likely to produce the opposite effect from that which they desire.

H. P. HIMSWORTH:

University College Hospital Medical School.

ÆTIOLOGY OF UTERINE DESCENT

SIR,—I have read with interest and regret the discussion on uterine descent in THE LANCET of Jan. 18—with interest because our friends in Ireland can still pass the time at academics, and with regret because with so much leisure a better picture was not presented. To impute uterine descent to damage of the uterine ligaments during labour, as though the uterine ligaments are alone concerned in the uterine position, seems to me extraordinary. The aperture in the pelvic floor through which the urethra, vagina and rectum pass to reach the surface of the body is only about 1½ in. long and is bounded in front by the pubic arch, and at the sides and behind by the U-shaped muscle, part of the pelvic floor. When one reflects that it is through this aperture that the child must pass to be born, one would have thought that obstetricians and gynæcologists—especially in Ireland, where they are so advanced in such matters—would have given some credit to the pelvic floor, reflecting that not only does it retain the pelvic viscera in the non-pregnant (during coughing or when lifting heavy weights or playing tennis), but that during pregnancy it hypertrophies, presenting in well-developed primigravidæ a great thick band almost as strong as an iron ring. And they might also have reflected that injury to it during childbirth probably has a bearing on subsequent prolapse. But in your report there is not a word suggesting that this structure is at all important, or that injury to it is of any consequence.

Why do obstetricians and others glue their eyes on the uterine ligaments? Three operations were mentioned as giving the surgeon insight into the "importance" of the ligaments of the uterus: vaginal hysterectomy, the Fothergill operation, and Wertheim's operation. The speaker did not mention hysterectomy of the pregnant uterus, an operation which according to Bland-Sutton is one of the easiest in surgery because all the uterine ligaments become softened in pregnancy; indeed he might have said that they almost disappear. How could the opener of the discussion maintain that the uterosacral ligaments during pregnancy "prevent undue falling forward of the heavy fundus?" Does he think not only that the pelvic floor—striated musculature—is useless, but that the abdominal wall is useless too? Who has seen the uterine ligaments in late pregnancy as bands capable of sustaining the heavy uterus? Nobody. During childbirth the pelvic floor is damaged anteriorly by the occiput sliding or grinding semi-laterally past the anterior arm of the taut muscle which, displaced laterally by the fœtal head, is caught between the fœtal bony occiput and the semi-lateral bony pubic arch; the muscle-fibres are cut as by a knife, and this may occur without any laceration of the vagina.

That women with this lesion suffer in consequence from prolapse is confirmed by the effect of the related surgical reply. The arm of the puborectalis which has been torn or cut is exposed. The anterior extremity of the muscle band is severed from its origin and fixed by suture to the pubic arch more medianly. I have done this operation on one or other side, sometimes on both, over seventy times with one death, and I have had several failures but some brilliant successes. When the pelvic floor is intact and functions properly the ligaments of the uterus can be left to take care of themselves.

Rugby. R. H. PARAMORE.

TREATMENT OF WAR NEUROSIS

SIR,—One or two points in last week's article by Dr. Eliot Slater and others call for clarification. They have seen over 1500 cases of neurosis and psychosis and it is a pity they do not give any indication of the proportion they have been able to send back to duty, both to fighting units and to others imposing less of the active stress of warfare. These figures would be instructive because the impression the article conveys is one of therapeutic pessimism, and indeed they emphasise that treatment should not be aimed too high and that over-optimism is to be avoided.

Admittedly the prognosis depends on a number of factors, particularly the type of strain the patient has been subjected to and the rapidity with which he is brought under treatment, and it is astonishing to learn that it may be weeks or months before even the possibility of treatment is reached. I had hoped this was a thing of the past. But I formed the opinion that more could be done for the different types of cases by psychotherapy than the authors seem to believe, even without the use of radical methods. This view is supported by a large experience in the last war and by the cases I have seen so far in the present war.

Dr. Slater and his colleagues will therefore have to be prepared to meet the criticism that, in advocating so freely discharge from the Army, they may be taking the easy course and that, having regard to the very qualified views they hold as to the value of psychotherapy, they are perhaps leaving important measures of treatment untried. They state that it is no good sending back into the Army, merely because he is symptom-free, a man who is liable to break down under small strain, and also that it is necessary to make an assessment of the personality before deciding on the disposal of the case. It would be of great interest to learn what criteria they use in estimating this liability to breakdown and what qualitative and quantitative factors they employ in assessing the personality.

Many excellent and tried soldiers have neurotic qualities and considerable numbers of men in the last war made good after an attack of war neurosis even on being returned to the environment which precipitated the breakdown.

Harley Street, W.1. FREDERICK DILLON.

CHOICE OF ANÆSTHETIC IN EMERGENCY

SIR,—Reading your review of the Essentials of General Anæsthesia, it seemed to me that among the many alternatives discussed one aspect was neglected; and this omission is common in other volumes on the subject. What anæsthetic should be used in an emergency when no experienced anæsthetist is available? Surely there can be no doubt that a chloroform-ether mixture is the safest and easiest. It needs no special apparatus, just a mask, tongue forceps, gag and drop bottle. Men educated in Scotland, certainly up to the first decade of this century, rarely used any anæsthetic other than chloroform. That there were occasional fatalities I know. I never saw one. The addition of ether undoubtedly diminished its dangers, without incurring the risk of lung complications not rarely fatal when open ether was given.

From my own experience I am sure that the failure to give a "good" anæsthetic is the fear engendered by London teachers, especially in the years at the beginning of the century when the chloroform-ether controversy was at its height. Too often I have seen and experienced the inadequate anæsthesia brought about by this fear, and the consequent giving of too small quantities of an

anæsthetic. The administration of a chloroform-ether mixture is easily taught and the technique so simple that any doctor in an emergency can give it, with success both from the patient's and surgeon's point of view.

Lowndes Street, S.W.1. H. BECKETT-OVERY.

SAVING ON DRUGS

SIR,—I am pleased to hear that the therapeutic requirements committee of the Medical Research Council are to publish a revised edition of their memorandum on economy in the use of drugs. This committee has done exceptionally valuable work, but unfortunately its recommendations are read only by a comparatively few even though they are published in the medical journals, because sad to relate probably only 50% of medical men read current medical journals. This influential committee must therefore go further than mere recommendation and persuade the appropriate ministry to prevent the importation or manufacture of all drugs in category C of the committee's classification. At present bananas and other valuable fruits are banned but the importation of cassia, fœniculum and tamarindus can continue unchecked.

The committee has also published a list of medicinal plants which could be grown in this country. The Ministry of Health in conjunction with the Ministry of Agriculture are doing something to carry the proposals into effect. But more energetic action is required. Let the Royal Colleges disimburse some of their lucre and establish experimental farms for the growth of medicinal plants on a commercial scale. Such a long-term policy might also be the first step in the much needed rationalisation of the chaotic drug industry.

Mitcham, Surrey. MAURICE H. PAPPWORTH.

CHILLY SWEEPER

SIR,—This morning I observed a man sweeping away snow in Harley Street. He was dressed in a thin blue jacket and shabby trousers both drenched in the icy sleet which was falling at the time. It seems a grim irony that in this street which symbolises the centre of medical knowledge to many people a man should be doing such work in a garb which no-one could pretend to be healthy. I presume that he was doing casual work for Marylebone borough council. Surely there is some way of seeing that men working in the freezing cold under heavy sleet are provided with adequate protection against it—particularly as it seems improbable that they have a change of clothes or underclothes.

Harley Street, W.1, Jan. 19. CLIFFORD ALLEN.

FEEDING OF CHILDREN

SIR,—The reduction of the meat ration for children is to my mind a dangerous act. It is not perhaps the reduction itself but the fact that the Government is capable of reducing the diet of growing children in any item. In this total war children have suffered, and will suffer, terribly, but if we are to win the war we must adhere to our war aim to preserve and advance Christian living. Such living demands the achievement of the best possible care of the growing child, and the war should be no excuse for a falling off from the highest standards in environment, in education and in the feeding of children. Things happen very quickly in childhood and the chances of doing good or ill to a growing child pass and pass again. There may be little to show as each opportunity arises, but our children of today will emerge as men and women of Britain still growing, but profoundly affected by the standard of skilled care and attention and love which has been given to their education.

As a result of rationing of food associated with the 1914–18 war the incidence of fractures at a famous school rose from an average of 0·75% per annum to 1·78% (Friend, G. E. The Schoolboy, Cambridge, 1935. See *Lancet*, 1935, **1**, 1394). A rise in the incidence of fractures is a crude and obvious sign of impaired health, and long before such manifestations appear there must be an appreciable degree of subnormal health which will alter the workings of growth and thereby have a permanent effect on human life, as well as exposing these growing lives to greater risk of disease. The Ministry of Food should treat the feeding of children as a separate problem, decide on the optimum diet and supply such a diet if at all possible, even at the sacrifice of ration to the adult population. Let the scientist dietitians experiment on the adult population. May be we could "go to it" better and better on porridge, potatoes and milk.

Sutton, Surrey. A. L. KERR.

TYPHOID IN NOTTINGHAM

SIR,—In the review in your issue of Jan. 11 (p. 57) of my annual report on the health of the City of Nottingham for 1939, you refer to an outbreak of typhoid fever. You say that all but two of the cases were infected on the same day. This is incorrect and is not to be found in my report. You also say that the outbreak was due to an infected food. I did not limit it to one food. In spite of your provocative note I am not to be tempted to disclose further details, for reasons still valid. There was proof within a few days of mode of spread, and by means of such proof the outbreak was controlled. If your note means that outbreaks of true typhoid fever are never due to specifically infected food, then I err in good company inasmuch as there are no fewer than three such outbreaks reported in the annual report of the chief medical officer to the Ministry for 1938. The Nottingham outbreak was typhoid, not paratyphoid. Your use of the term "eberthella" is noticed; should this not be allowed to die? Bacteriologists tell me it is obsolete.

CYRIL BANKS,
Medical Officer of Health, Nottingham.

*** Dr. Banks is a little hard on an interested inquirer. We did not suggest that the outbreak was traced to any specific food; this is one of the points we do not know and Dr. Banks still does not say. If the infection was spread by foods generally or various, then the tracing of the epidemic in the time would have been possible only if the cases were limited to persons in an institution, or who had fed at the same table. Nor did we imply that outbreaks of true typhoid are rarely spread by infected foods; we knew of no outbreak the cause of which was suspected in 24 hours and proved within a few days—and said so. Until Dr. Banks told us that the disease in Nottingham was typhoid, not paratyphoid, we were not justified in assuming that it was. The word *eberthella* would at all events have made it clear.—ED. L.

EDUCATION OR COMPULSORY IMMUNISATION?

After reading Dr. Killick Millard's letter on compulsory immunisation in THE LANCET of Nov. 23 (p. 667) Dr. CHARLES F. BOLDUAN, director of the Bureau of Health Education in New York, has sent us some information about how his health department has answered this question. In 1910 the number of deaths from diphtheria in New York city was 1715, a rate of 124·8 per 100,000 children under fifteen. By 1928, when the department first set itself seriously to control diphtheria, the number of deaths from the disease had gradually fallen to 642, and the rate to 38·1. The department might have advised the Board of Health to enact a law compelling parents to have their children immunised, and under a power dating from 1866 such a law would have had all the force of one passed by the state legislature itself. Instead, however, it decided on health education in preference to police power, and organised an intensive campaign to instruct parents on the value of immunisation. Since then the deaths from diphtheria have fallen rapidly; by 1930 they were down to 198, by 1936 to 35, and by 1939 to 22. Up to Dec. 23 there had only been 10 deaths during 1940 and this in a city grown to a population of 7,392,000.

The University of London extension and tutorial classes council in coöperation with the Central Association for Mental Welfare propose to hold a course of lectures and clinical instruction for medical practitioners on mental deficiency and allied conditions. The course will be held at Oxford and the dates suggested are from March 24 to April 4. The course cannot be held unless sufficient numbers apply and those who wish to attend are asked to send in their applications as soon as possible to the educational secretary of the association. The course will include lectures on the nature of mental deficiency; on the administrative procedure in the ascertainment and treatment of mental defectives under the Mental Deficiency Act; on the work of the school medical officer in relation to defectives; and on the psychology of defectives.

Parliament

MEMBERS of Parliament have returned to their duties after a fairly lengthy Christmas recess with an appetite for information, so far as it can safely be vouchsafed to them, on the growth of our war effort. Two days last week were given up to a useful debate in the House of Commons on the need for expediting production and for utilising to the maximum extent the nation's available man-power. These are the two questions round which most of the friendly criticism of the Prime Minister and his colleagues in the War Cabinet has centred during the past few months. It was all to the good, therefore, that this criticism should find an adequate outlet in public session, and receive a definite and authoritative answer. The attack proceeded broadly on two separate fronts. First, Mr. Shinwell strongly urged the desirability of centralising the controlling authority by the appointment of an Economic Minister charged with the same overriding power on the home front as the Defence Minister exercises on the military front. Mr. Churchill replied to this with a spirited defence of the committee system he has fashioned for this purpose, and which he thinks is more in keeping with our political traditions than machinery of a more dictatorial nature. In any case, he reminded the House that they had placed on him the responsibility for organising the national war effort and he was quite ready to be judged by results. In the end the overwhelming sense of the House was in favour of trusting Mr. Churchill to do the job in his own way. There was, however, a sharp cleavage of opinion on the question of compulsion. Mr. Shinwell found himself in conflict with many of his Labour colleagues in saying that it was "impossible to impose military discipline on several millions of young men and at the same time to allow the remaining millions of the population to escape their responsibilities." This point of view found strong support from Lord Winterton, but Mr. Lawson vigorously denounced it with the remark that "those who want to compare compulsion in the Army and compulsion in industry simply know nothing about industry." But here again the Prime Minister told his critics frankly that he fully appreciated the situation, and had taken adequate means to meet it. He admitted that we were now about to enter for the first time in this war a period of man-power stringency, but this would be fully met by Mr. Bevin, the Minister of Labour. One statement made by Mr. Churchill cheered and interested the House above all else. It was amazing, he said, that after sixteen months of war between the greatest states armed with the most deadly weapons not more than 60,000 British folks, nearly half of whom were civilians, had lost their lives by enemy action. All will agree that this figure is horrible enough, but Mr. Churchill put the matter in the right perspective when he remarked that it was far less than the casualties in a single protracted battle on the Western Front in 1916, 1917 or 1918. Therefore, while our Army is growing every week in power, efficiency and equipment, and while a decisive expansion of the Air Force is in progress, it is the munition factories and agricultural rather than the fighting services which will in the next five or six months make the chief demand for man-power on the public.

QUESTION TIME

B.M.A. Medical Planning Commission

Sir ERNEST GRAHAM-LITTLE asked the Prime Minister whether his attention had been drawn to the formation, by the British Medical Association, of a medical planning commission to consider problems of reconstruction and reorganisation in the field of medicine in the postwar area; and whether in view of the complexity of these problems and the importance to the public as well as to the medical profession of such reorganisation he would consider the desirability of appointing a royal commission to conduct this inquiry with the ultimate purpose of appointing an independent Government commission to regulate this reorganisation, in place of an individual and unofficial medical association, whose recommendations could not command the general assent which would be accorded to a Government inquiry.—Mr. WINSTON CHURCHILL replied: I am aware of this inquiry by the British Medical Association, and of similar inquiries by other bodies interested in the medical and hospital field. They will no doubt afford a useful addition to the abundant material available, in the reports of commissions and elsewhere, when the opportunity of reconstruction comes. I do not think that the appointment of a royal commission would in present circumstances be opportune.

A.R.P. Doctors and Service on Local Authorities

Dr. H. B. MORGAN asked the Minister of Health under what statutory authority his department had ruled that, notwithstanding the provisions of the Local Government Staffs (War Service) Act, 1939, doctors undertaking for reward professional work in connexion with air-raid precautions were disqualified from becoming, or continuing to remain, members of the council of local authorities; and would appropriate steps be at once taken to correct such an unfortunate and inequitable position.—Mr. M. MACDONALD replied: No such ruling has been given, either by the Minister of Home Security or by myself; nor is there any statutory authority under which it could have been given. I am aware that the clerk of a local authority has advised his council that a medical officer appointed by them to take charge of an air-raid shelter is disqualified for membership of the council. If proceedings were instituted against any person holding such an appointment who became, or continued to act as, a member of the council, it would be for the court before which proceedings were taken to determine whether, in the light of the relevant statutory provisions, he was or was not disqualified.

Evacuation of Patients from London

Mr. GEORGE STRAUSS asked the Minister whether he was aware that there were still a large number of old and chronically sick cases in the London hospitals; that many casualties in recent raids on London had been caused thereby; and would he now take steps to have them removed to reception areas.—Mr. MACDONALD replied: The number of old and chronically sick cases in the London hospitals has been very much reduced, and is now less than half the normal. Many of those who remain have expressed unwillingness to go. Top floors and other particularly exposed parts of the hospitals are not in use, and casualties have been few. I regret that it is not practicable at the present time for all the remaining chronic sick to be moved out in view of the heavy calls made on the outer beds by acute sick, air-raid casualties and service cases.

R.A.M.C. and Air-raid Casualties

Mr. F. S. COCKS asked the Minister whether he would consult with the military authorities with a view to securing the coöperation of the Royal Army Medical Corps in the work of treating casualties in bombing raids.—Mr. MACDONALD replied: Coöperation of the kind has already been agreed in principle and has in considerable measure been put into force, particularly in the case of specialist officers. In some cases R.A.M.C. orderlies have assisted in the initial treatment of civilian casualties. The Secretary of State for War and I are continually reviewing the position with a view to increasing the degree of coöperation between military and civilian medical officers.

Health in the Shelters

In reply to a question Mr. MACDONALD stated that in the City of London and the metropolitan boroughs 8 doctors are in whole-time attendance at shelters, 159 more are under contract to visit shelters each night, and a further 308 are on call.

In answer to a further question Mr. MACDONALD said that in addition to taking power to exclude a tuberculous person from a public shelter if his presence in the shelter is likely to be dangerous to other shelterers, he has made certain suggestions to local authorities for dealing with this problem. The responsibility for safeguarding the public health in any particular area rested in the first instance on the medical officer of health for the area, and Mr. MacDonald had no doubt that he would take steps to secure the provision of alternative shelter accommodation for any tuberculous persons for whom he thought such provision is necessary in the public interest.

Civilian Prisoners of War and N.H.I.

Mr. BEN SMITH asked the Minister if he was aware that, in the case of seamen removed from their ships by the enemy and treated as civilian prisoners of war, no health and pensions insurance contributions were payable as from the date of the loss of the ship either by capture or sinking; that, in consequence, all such seamen were in arrears of contributions, and should they be released prior to or during the penalty

year 1941, there would be a reduction or cessation of benefit unless the accrued arrears were discharged at the full health and pensions rate by the seamen; and whether, as the position had already arisen in the case of seamen rescued from the *Altmark*, he would ensure that such men were not called upon to make substantial payments to clear arrears in the circumstances.—Mr. MACDONALD replied: I am aware that the existing law does not make satisfactory provision for maintaining the National Health Insurance and contributory pensions rights of civilian prisoners of war and I hope to have an early opportunity of introducing the necessary amending legislation.

Our Reinforced Loaf

In reply to a question the Parliamentary Secretary to the Ministry said that the total cost of fortifying white flour with vitamin B_1 could not be stated, but it is not expected to exceed one-tenth of a penny per quartern white loaf.

In reply to a further question he added that wholemeal bread made from a 100% extraction flour contains about 28 units of vitamin B_1 per oz., but that bread made from such a flour is not fully digested. Bread made from flour of 85% extraction, which it has been decided to adopt as the minimum for a wholemeal flour, would contain about 20 units of vitamin B_1 per oz. It was proposed to add vitamin B_1 to white flour in sufficient quantity to raise the vitamin B_1 content of white bread also to 20 units per oz.

Foreign Firms and Patents

Sir ERNEST GRAHAM-LITTLE asked the Minister of Economic Warfare whether he had investigated the possibility of there being any direct or indirect financial relationship between the Hoffman-La Roche Company of Basle, parent company of Roche Products Ltd., and the German concerns of Bayer Products or I.G., and whether he had satisfied himself that none of the payments made to Roche Products Ltd. for synthetic vitamins B_1 would pass into the possession of Germany through Switzerland.—Dr. DALTON replied: This matter has been carefully investigated; but I have found no evidence that any of the payments made to Roche Products Ltd. will pass to Germany through Switzerland.

Sir ERNEST GRAHAM-LITTLE asked the Parliamentary Secretary to the Ministry of Food on what licence from the German I.G. patents for the manufacture of vitamin B_1 the Government is now relying for the right to manufacture this product; and why, in view of the war, any such licence was required to operate a German patent.—Mr. HARCOURT JOHNSTONE replied: The Government have not undertaken the manufacture of vitamin B_1, but will for the present obtain supplies from a firm of chemical manufacturers which had the right to use patents Nos. 471, 416 and 475, 595 covering inventions made by the German company, I.G. Farbenindustrie. Bayer Products Ltd. of Africa House, Kingsway, are the registered proprietors of both patents in this country.

Influenza

In reply to Sir FRANCIS FREMANTLE Mr. MACDONALD said: There is no evidence at present of any general epidemic of influenza. In 126 major cities and towns of England and Wales during the four weeks ending Jan. 13, 1939–40, there were respectively 27, 45, 94 and 158 deaths from influenza. The comparable figures for 1940–41 were 30, 40, 53 and 74.

Physical Training in London

In reply to a question the President of the Board of Trade stated conditions in London during the last five months have almost wholly precluded the continuance of evening activities. Nevertheless, good use has been made of the week-ends to train leaders and maintain recreative activities for young people, and a successful experiment has been made in central London in lunch-time keep-fit classes for girls and women. Some 300 classes, including keep-fit classes, are being held by the local authority in public shelters, and the provision of dormitory shelter is being facilitated in boys' and girls' clubs, so that the work of the clubs may continue during the evening, or an existing public shelter may be partially or wholly allocated for the same purpose. One of the three new recreation centres planned by the authority for opening last September has been opened. The meetings of the London Youth Committee and the Borough Youth Committees, like those of other committees of the London County Council, have been suspended by the council, but emergency arrangements were made to deal with urgent matters. These arrangements have, among other things, enabled over 60 applications for grant to be submitted to the board, and the board had made grants in respect of over 50 of these applications.

Accidents in Factories

The Minister of Labour announced that accidents reported under the Factories Act were in 1940 1384 fatal and 231,000 non-fatal, and in 1939, 1104 fatal and 192,371 non-fatal. The figures for 1940 are provisional and subject to correction.

Public Health

Health in Northern Ireland

THE annual report of the Registrar-General for Northern Ireland for 1939 shows that the customary peace-time progress in declining mortality-rates was well maintained in that year. The population is slightly increasing and is estimated as 1,295,000. The crude death-rate of 13·6 per 1000 was the lowest recorded since Northern Ireland became a separate administrative unit. Standardisation to allow for the changing age and sex composition of the population gives a figure which has declined steadily over the previous five years and is less than the level of 1926 by nearly 20 per cent. The infant-mortality rate also touched its lowest point but at 70 per 1000 live births is high in comparison with the figure of 50 in England and Wales. There is a considerable difference in this respect between the urban and rural districts of Northern Ireland with rates respectively of 80 and 58. The most striking component of this difference is, the detailed tables show, mortality attributed to diarrhœal diseases. In 1934–39 these causes of death were consistently 3–4 times as important in the urban as in the rural communities, and such a difference might well be an object of special inquiry.

The downward trend of the tuberculosis death-rate continued unchecked to a low record level, but its importance is still apparent in the observation that tuberculous diseases were responsible for very nearly half the total mortality at ages 15–25 and rather more than a third at 25–35. The death-rate from pneumonia showed a decline from 0·80 per 1000 in 1938 to 0·62 in 1939, and as influenza was probably present to a greater degree in the latter year (judging from its mortality) modern methods of treatment may well be the cause. Similarly considerable improvement is apparent in the rate of mortality in pregnancy and childbirth. In 1935–36 2·2 deaths per 1000 births were attributed to puerperal and post-abortive sepsis, in 1937–38 there were only 1·2 and in 1939 as few as 0·8. No corresponding improvement is shown by other puerperal diseases. Deaths from violence were responsible for 3·4% of all deaths and motor vehicles yearly supply about a fifth of them.

From the Annual Reports

NORWICH

Dr. V. F. Soothill reports that the population of Norwich has fallen to 121,700. For 1939 the Registrar-General furnishes two figures of population, one for the calculation of the birth-rate, the other for the death-rate. This is usual in war-time when many adult males are on service, the deaths of whom are not accredited to the districts, and, in the present war, evacuation and reception have disturbed normality. The figure for calculating the death-rate is below that for the birth-rate except in some reception areas. The higher number gives the nearer approach to the true population figure. Before the industrial revolution, Bristol and Norwich were the only towns in England outside London with any considerable population. Their populations have increased actually since the eighteenth century, but relatively have fallen greatly. They retain the honour of being the only towns which are counties by historical right, though for administrative purposes they have no advantage over the other county boroughs.

In 1939 Norwich had the low infantile-mortality rate of 27·77. Many districts in 1939 registered total infantile-mortality rates below the neonatal rates of former years, so we must be making some progress in the reduction of neonatal deaths which had stubbornly resisted our endeavours. The year was exceptional and we have no hope that its low rates will be repeated until peace has been restored, but the fact that they have been attained tells us that neonatal death is not "incurable." The birth-rate was 13·29 and the adjusted death-rate 11·52. The crude death-rate was 12·53, so the population is not falling from natural decrease. There were

two maternal deaths, one from sepsis and one other, giving a total maternal mortality of 1·24 per 1000 live births. Vaccination is in a very poor way in Norwich, for only 15·6% of the infants born were successfully vaccinated in 1939, and 78·3% of the parents were conscientious objectors. Four new cases of ringworm were found in the school-children, three of which were in one family. The first discovered was a boy recently returned from India who was presumed to have been cured, but he infected a brother and a sister. In the past, histories comparable with this were abundant, but of recent years have been so rare that when they occur they are worth recording.

Infectious Disease in England and Wales

WEEK ENDED JAN. 4

Notifications.—The following cases of infectious disease were notified during the week; smallpox, 0; scarlet fever, 1335; whooping-cough, 2783; diphtheria, 1396; enteric fever, 18; measles (excluding rubella), 17,816; pneumonia (primary or influenzal), 1297; puerperal pyrexia, 122; cerebrospinal fever, 229; poliomyelitis, 9; polio-encephalitis, 1; encephalitis lethargica, 2; dysentery, 68; ophthalmia neonatorum, 62. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on Jan. 10 was 2279, including: scarlet fever, 319; diphtheria, 345; measles, 884; whooping-cough, 119; enteritis, 32; chicken-pox, 221; erysipelas, 48; mumps, 27; poliomyelitis, 1; dysentery, 11; cerebrospinal fever, 47; puerperal sepsis, 6; enteric fevers, 6; german measles, 2; other diseases (non-infectious), 127; not yet diagnosed, 84.

Deaths.—In 126 great towns there was no death from smallpox or enteric fever, 3 (0) from scarlet fever, 27 (2) from whooping-cough, 21 (5) from measles, 54 (2) from diphtheria, 34 (4) from diarrhœa and enteritis under 2 years, and 53 (8) from influenza. The figures in parentheses are those for London itself.

Fatal cases of diphtheria were scattered over 24 great towns, Liverpool reporting 12 deaths and no other town more than 4. There were 14 deaths from whooping-cough at Birmingham.

The number of stillbirths notified during the week was 204 (corresponding to a rate of 41 per thousand total births), including 16 in London.

BACTERICIDAL AEROSOLS

Dr. C. C. Twort writes: There were some errors in my letter of Jan. 11 (p. 61). In the list of five desirable characteristics of a germicidal aerosol the fourth and fifth should read "it should preferably possess high persistence," and "it should preferably be non-inflammable." Then in the paragraph on smokes on page 61 the passage beginning at line 5 should be amended to read "Their outstanding feature is that they are much more bactericidal in the air to the flora of the saliva than they are to broth emulsions of the several laboratory cultures tested, and when equal parts of water and sterile saliva were used as an emulsifying medium the sensitivitiy of the contained bacteria to the germicide was increased, instead of being decreased as it was with hypochlorite, S^2 or ultraviolet light. The average results when using various concentrations for varying contact times indicated that smokes were ten times as lethal and 1% hypochlorite solutions were a tenth as lethal to the flora of the saliva compared with the lethal effectiveness on broth emulsions of stock laboratory cultures." On page 62, last paragraph, I should have advocated balsamic smokes, rather than the burning of balsamic candles. In the legend to the table it should have been made clear that the *Corynebacterium xerosis* is not our standard test organism and was only used in certain of the experiments with smokes and S^2, more especially those with very high dilutions of the latter. Elsewhere the organism used was the "F coccus," a saprophytic, white, gram-positive micrococcus.

PYLUMBRIN is a stable sterile 35% aqueous solution of the diethanolamine salt of 3:5 di-iodo-4-pyridone-N-acetic acid which Messrs. Boots are manufacturing in their Nottingham laboratories and are supplying in ampoules of 3 c.cm. and 20 c.cm. for excretion pyelography. It may be given either by intravenous injection or subcutaneously if a suitable vein cannot be found. Clinical trial has shown that it is well tolerated and gives good contrast shadows.

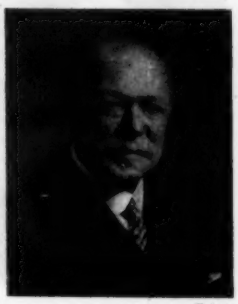
Obituary

CHARLES THURSTAN HOLLAND

CH.M., LL.D. LPOOL, F.R.C.S.

Mr. Thurstan Holland who died on Jan. 16 at the age of 78 was one of the small group of Liverpool pioneers who introduced radiology into this country.

Born at Bridgwater in 1863, the son of Alderman W. T. Holland, he was educated privately and at University College Hospital. He qualified M.R.C.S. in 1888 and the same year set up in practice in Liverpool. He was already an expert amateur photographer—he was also an expert mountaineer and in his Alpine studies these two hobbies were happily combined. But now his photography assumed a new importance. At this time Oliver Lodge held the university chair of physics and Holland was helping Robert Jones, and he has described how these contacts started him on what was to become his life's work. Towards the end of 1895 Röntgen discovered that an electric charge passing through a vacuum produced a ray much more penetrating than ordinary light. Sir Robert heard of the discovery through a private letter before any reference had been made to it in an English paper. Sensing immediately the value of the discovery as applied to his own work he ordered an apparatus and placed it in Holland's hands. Later he wrote "The first X ray in our country was, I think, taken by Dr. Holland and myself with a little tube, and we were able to develop a photograph of a small bullet which was embedded in a boy's wrist." At first the new discovery was used mostly on limb fractures and foreign bodies, but the scope of the work widened when in the same year the Royal Southern Hospital asked Holland to set up one of the first radiology departments of the country. To begin with he used his own apparatus which was erected in a semi-underground room placed under the stairs leading up to the wards. In 1904 Holland left to organise the new radiology department at the Liverpool Royal Infirmary. His work here was interrupted by the war, when as consulting radiologist to the Western Command he spent busy years organising a radiology service from Pembroke to Carlisle. He also sat on the War Office committee on radiology. But in the midst of this administrative work he found time to devise and perfect his new technique for localising bullets.



Haines

The war had given an impetus to the development of radiology and in 1920 he was appointed lecturer in radiology in the University of Liverpool, and two years later he was granted the degree of Ch.M. in recognition of his services in organising the new diploma in that subject. In 1928 as a member of twenty years' standing he was elected to the fellowship of the Royal College of Surgeons. He had twice been president of the Röntgen Society, and in 1929 he served as president of the British Institute of Radiology, with which it had been incorporated. In 1924 Holland delivered the Silvanus Thompson lecture and the following year he presided over the first International Congress of Radiology when it met in London. He was also a fellow of the American College of Radiology.

Holland was blunt and downright, and if you did not know him well he could be withering, for he had the honesty as well as the kindness of a big-hearted man. After his illness in 1931 he aged a good deal and as his intimate friends died he became very lonely. But he still retained his sense of humour if rather grimmer than before and he enjoyed watching cricket at Aigburth though he could not flay enough the modern dull county games. He was a great man with a fine zest for life.

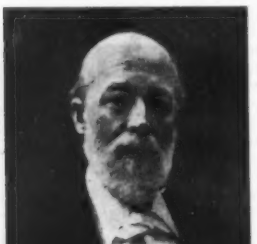
He married Lilian Fergusson who died in 1924 and he is survived by one son.

FRANK THOMAS PAUL

CH.M., D.SC.LPOOL, F.R.C.S.

THROUGH the death of Mr. Paul on Jan. 17 so soon after that of Mr. Thurstan Holland, Liverpool has lost yet another of the group of men who made her school of medicine famous.

Paul was born at Pentney, Norfolk, in 1851. He was educated at Yarmouth Grammar School and after a brief experience of commercial life he entered Guy's in 1869. He qualified in 1873 and after holding house-posts at Guy's he went to Liverpool as resident medical officer and superintendent at the Royal Infirmary, a post which (it was later recalled) then combined duties which were carried out 50 years afterwards by no less than eleven different people. After five years on the staff of the Stanley Hospital in 1883, on the retirement of Thomas Ransford, Paul was appointed surgeon to the Royal Southern Hospital and here he remained until 1890 when he returned to the Royal Infirmary as surgeon. As an administrator and teacher he played an important part in the growth of the medical school in its incorporation in the university. He served it successively as demonstrator in physiology, as pathologist, as lecturer in dental anatomy and in clinical surgery, as professor of medical jurisprudence, and for seven years as dean of the medical faculty. In 1912 he retired from the staff of the Royal Infirmary, but the war of 1914 recalled him to hospital work and with the rank of major R.A.M.C. (T.F.) he was attached to the first Western General Hospital.



Paul's skilful technique as a surgeon was founded on his knowledge of surgical pathology and excited the admiration of his brother craftsmen. Lord Moynihan delighted to watch him operate, and when in 1926 the late Mr. Frank Jeans presented a cast of Paul's hand to the Liverpool Medical Institution (of which Paul had been president) he said, "Paul operating in the heyday of his manual efficiency always made me think that he did with his hands what Pavlova did with her feet, only Paul's work was much more useful." In replying, Mr. Paul reminded him that the gentle touch comes from the heart rather than from the hands. In 1925 his colleagues from the Royal Infirmary, to celebrate his 75th birthday and his fiftieth year as member of the institution, published a volume of selected papers from his writings. Paul's name will always be associated with the surgery of the large bowel and Paul's tube is as well known as Thomas's splint; in this volume the first use of the glass tube in 1891 is described, along with the experimental work on gastroenterostomy and intestinal suture on which it was based.

His last years of retirement were spent at Grayshott, Hants, where he grew orchids and indulged his passion for colour photography. It was a happy time, for he had always enjoyed the freedom of the countryside when he had the chance, camping in the open or touring in a caravan.

Mr. Paul married Geraldine Greg, who survives him with three daughters.

EDWIN D'ARCY McCREA

M.D., M.CH. DUBL., F.R.C.S., F.R.C.S.I.

EDITH FLORENCE WILLOCK McCREA

M.B. DUBL., F.R.C.S.I., D.P.H.

Edwin D'Arcy McCrea and his wife, Edith McCrea who were killed with their two children during an air attack on Manchester were both graduates of Dublin University and fellows of the Royal College of Surgeons in Ireland. Mr. McCrea, who also held the English fellowship, came to England in 1922 where he was appointed registrar in the urological department of Salford Royal Hospital. In 1934 he was appointed surgeon to the hospital. Prof. J. S. B. Stopford, who when he first settled in Manchester was associated with him and Prof. MacSwiney in several investigations, writes: "McCrea was the surgical member of the team, but he contributed far more than operative skill and it was easy to see that he possessed to a high degree those qualities which are essential for research. This association enabled me also to appreciate his fineness of character and sterling worth as a man. That was fortunate because few who did not come into such intimate contact could really know him in consequence of his reserved, modest and almost shy nature. By his tragic death Manchester has lost a distinguished surgeon at a time when he was approaching the peak of his power and influence. We were just beginning to reap the rich harvest which would have been the outcome of his intense labours, and there is little doubt that, if he had lived, he would during the next few years have greatly enriched surgical knowledge." Last May McCrea had published Diseases of the Urethra and Penis in which he reviewed surgical writings on these organs and with the help of excellent illustrations amalgamated them with his own findings. In his earlier days McCrea had been a fine tennis player and represented Ireland in the Davis Cup. But of late years he had devoted himself to his work and his patients. They and a few close friends were well aware of his generous and kindly spirit and his sincerity.

Mrs. McCrea, who went to school at Cheltenham College, qualified in 1921. She was an honorary surgeon to the Manchester Babies' Hospital, where she had held the post of resident medical officer when she first came to Manchester. She also worked as surgical registrar and surgical assistant at Ancoats Hospital, and as surgical assistant at the Stretford Memorial Hospital.

Medical News

University of Cambridge

On Jan. 25 the following degrees were conferred:—

M.B., B.Chir. (by proxy).—J. S. Hesketh, M. R. Pollock, F. T. G. Prunty, M. A. Fawkes, Owen Clarke, D. M. Jackson, Lucien Read, P. F. Milling, R. C. Tufton, D. W. M. James, Robert Morton, C. S. N. Swan, W. R. Burkitt, W. M. Scott, J. O. D. Williams, A. G. Farr, L. A. Little, H. D. L. Campion, and F. J. Y. Wood.

University of Wales

At recent examinations the following were successful:—

D.P.H.

Part II.—R. T. Bevan, Phyllis E. M. Bowen, Sonia D. Dymond, Gladys M. Herbert, and Mary Williams.

Scottish Conjoint Board

The following, having passed the final examination of the board, have been admitted licentiates of the Royal Colleges of Physicians and Surgeons of Edinburgh and of the Royal Faculty of Physicians and Surgeons of Glasgow:—

M. A. Attia, R. R. B. Baxendine, Michael Berman, R. H. Brundage, David Collins, M. M. Dinowitz, Morris Dirdack, M. L. A. El Diwany, S. C. J. Falkman, Sidney Finkelstein, Eleanor Franks, H. H. Frumin, Joel Glass, A. A. Goldstein, George Kilgour, Irwin Krauthamer, Thomas Lyle, Donald MacKay, W. L. Milligan, Z. F. Nakhoda, R. M. Norwell, K. I. Peckitt, Bernard Schneider, William Schreiber, H. J. J. Schwartz, Murray Serlen, John Simpson, Frederick Stein, Robert Stewart, W. J. Taylor, H. B. Wender, Tan Yong-Leng, and A. H. Zidan.

The following graduates of recognised universities, having passed the final examination, have also been admitted licentiates:—

Erwin Cohnreich, M.D. Munich; George David, M.D. Berlin; Simcha Geliebter, M.D. Milan; H. E. Haas, M.D. Cologne; Berthold Hermann, M.D. Vienna; and Eugene Tiscenco, M.D. Berlin.

Royal College of Obstetricians and Gynæcologists

At a meeting of the council held on Jan. 25, with Mr. Eardley Holland, the vice-president, in the chair, M. T. Drummond (Sydney) was admitted to the membership in absentia. The following were elected to the membership:—

Alice J. M. T. Barnes, London; A. P. Barry, Dublin; D. R. Beaton, R.A.M.C.; S. A. Bond, London; Margaret M. Burton, London; A. S. Duncan, Edinburgh; H. R. Duval, London; Jack Joseph, London; H. C. McLaren, Aberdeen; J. C. Newbold, London; R. B. K. Rickford, London; K. G. Seager, Croydon; K. C. Shah, Bombay; and D. C. Wiseman, Leicester.

Professor W. Fletcher Shaw, the president, was reappointed to represent the college on the Central Medical War Committee, and Mr. J. P. Hedley was renominated representative on the council of the Queen's Institute of District Nursing.

The Gillson scholarship in pathology of the Society of Apothecaries of London has been awarded to Dr. Helen M. Wright for 1941.

In a recent casualty list Captain D. B. Milne, L.R.C.P.E., R.A.M.C., and W.S./Captain A. L. Potter, M.D. Lpool, R.A.M.C., are posted as wounded.

The Chadwick trustees recently offered two prizes for essays on the construction and management of air-raid shelters, with special reference to ventilation, heating, sanitation and the provision of sleeping accommodation. They have now awarded the first prize of £100 for the essay submitted jointly by Mr. Phillip O. Reece, A.M.Inst.C.E., and Dr. S. L. Wright, of Wembley, and the second prize of £50 for the essay submitted by Mr. Jocelyn F. Adburgham, L.R.I.B.A., of Victoria Street, S.W.1.

At the Royal Society of Medicine on Wednesday, Feb. 5, at 2.30 P.M., Dr. J. D. Rolleston will read a paper to the history of medicine section on medical aspects of Saint Simon's memoirs. At 2.30 P.M., on the same day Mr. J. B. Hunter will deliver his presidential address to the section of surgery. He will speak on the Emergency Medical Service and the future. On Friday, Feb. 7, at 10.30 A.M., Prof. H. Frey, Dr. A. B. Stokes and Mrs. Irene Ewing will open a discussion at the section of otology on the psychological aspects of deafness. At 2.15 P.M. on the same day at the section of laryngology Mr. V. Negus and Mr. W. Stirk Adams will open a discussion on adenoids—their influence and methods of removal.

Appointments

CRAIG, A. J., M.D. Malta, F.R.C.S.: surgical registrar at the National Temperance Hospital, London.
FRASER, J. A., M.B. Edin., D.P.H.: deputy county M.O. for the West Riding of Yorkshire.
GRAY, T. G., M.B. St. And.: R.S.O. at Blackburn Royal Infirmary.
MATHESON, N. R., M.B. Brist.: temp. asst. school M.O. for Plymouth.
PARSONS-SMITH, GERALD, M.A. Camb., M.R.C.P.: medical registrar at the Royal Cancer Hospital (Free), London.
PETTY, HAROLD, M.B. Leeds: R.S.O. at Clayton Hospital, Wakefield.
SPILLER, VIOLET, M.D. Geneva, M.R.C.S., D.P.H.: deputy M.O.H. for Barking.
WEBB, JOSEPHINE W., M.B. Lond., D.P.H.: temp. asst. M.O.H. for Ealing.

Births, Marriages and Deaths

BIRTHS

BAKER.—On Jan. 20, at Cheltenham, the wife of Dr. A. H. L. Baker—a son.
BURROWS.—On Jan. 23, at Burghill, Herefordshire, the wife of Dr. T. E. Burrows—a daughter.
HOOTON.—On Jan. 24, at Southport, the wife of Lieutenant William Hooton, R.A.M.C.—a son.
WOOLLEY.—On Jan. 26, at Derby, the wife of Surgeon Lieut.-Commander E. J. Starbuck Woolley, R.N.V.R.—a daughter.
YOUNG.—On Jan. 22, at Secunderabad, the wife of Lieutenant W. E. Young, R.A.M.C.—a son.

MARRIAGES

ELLIS—RUSSELL.—On Jan. 18, Richard W. B. Ellis, M.D., F.R.C.P., Flight-Lieutenant R.A.F. (V.R.), to Audrey Eva Russell, M.B.
JOHNSTON—TUTCHER.—On Jan. 23, at Old Woking Church, Munro K. Johnston, M.B., Captain R.A.M.C., to Margaret Elizabeth Tutcher.
ROGAN—CLARKE.—On Nov. 30, at Singapore, John Rogan, M.D., Major R.A.M.C., to Anne Clarke.

DEATHS

BAMBER.—On Jan. 9, at Downpatrick, Charles James Bamber, M.V.O., M.R.C.S., Colonel late I.M.S., aged 86.
BOSANQUET.—On Jan. 24, at Springfield Road, N.W., William Cecil Bosanquet, D.M. Oxfd, F.R.C.P., late fellow of New College, Oxford, aged 74.
FOWLER.—On Jan. 21, Charles Edward Percy Fowler, O.B.E., F.R.C.S., Colonel A.M.S. of Wickham Bishops, Essex.
FOX.—On Jan. 22, at Newtown Linford, Leicestershire, Ida Emilie Fox, M.D. Durh.
GREY.—On Jan. 23, in London, Francis Temple Grey, M.B., Ch.M. Sydney, M.R.C.P.
HORROCKS.—On Jan. 26, at Hersham, Walton-on-Thames, Sir William Heaton Horrocks, K.C.M.G., C.B., M.B. Manc., Colonel late R.A.M.C., aged 81.
LEVICK.—On Jan. 23, at Exmouth, George David Baker Levick, M.R.C.S., formerly of Pinner, aged 74.
MORRIS.—On Jan. 25, at Harrogate, Robert Alexander Morris, M.D. Durh., J.P.
STANISTREET.—On Jan. 26, at Bournemouth, Sir George Stanistreet, K.B.E., C.B., C.M.G., M.B. Dubl., Major-General late R.A.M.C., aged 74.
TAYLOR.—On Jan. 25, at Walton, Clevedon, Ashby Taylor, M.R.C.S., aged 74, of Sénéchal, Island of Sark.
WHITLEY.—On Jan. 13, at Stroud, Henry Walter Whitley, M.R.C.S.

Notes, Comments and Abstracts

WELFARE WORK IN A FIGHTING CITY

IT is never agreeable to see a sound health programme arrested, or worse still slipping back. The war might have shown us this picture often enough if the public-health service had not seen in the population shifts, the massing of people in shelters and the dietary changes produced by rationing an opportunity rather than a defeat. Dr. Violet Russell, writing of the effects of war on Kensington maternity and child-welfare work,[1] tells of the first evacuation, the filtering back, the second exodus and the second return of some. At the beginning of 1940 there were over 4000 children under five in the borough—about half the pre-war number; by the end of July there were over 5000, but after the second evacuation the number fell to 2500. This was an advantage in a borough which in peace-time is overcrowded. Four of the welfare centres were working at the beginning of 1940, but as the number of children rose they were increased to seven, three new ones being opened in first-aid posts. Workers found that customs were changing; with husbands employed instead of on the dole more mothers could stay at home to look after their children instead of going out as daily workers. The day nurseries had been closed when war broke out (except for one, transferred to the country) but their services were scarcely needed in this new state of things. In the same way, infants could be nursed at home instead of being admitted to hospital. The change in public opinion over hospital treatment in the last twenty or thirty years is strikingly illustrated by Dr. Russell's remark that "nothing less than a war would have got these mothers to consent to home nursing." Yet the sick infant is undoubtedly safer in his own home than in a ward, and it turns out that the district nurse can use the opportunity to train the mother in many important aspects of infant care. Mothers are also readily convinced that large shelters are not the best places for small infants. Most of them take the children into Anderson or small surface shelters, where the danger of infection is small. The national milk scheme at first seemed to provide a new danger; the council had been in the habit of supplying dried milk, and, when liquid milk superseded it in houses where accommodation for food storage scarcely exists, welfare workers were troubled to see the milk jug standing uncovered on the kitchen table, the toddler clutching the brim with grubby fingers and the rest of the family taking swigs from the jug when they thought of it. This familiarity with the family milk supply was an advantage to everyone but the baby. The concession of the Ministry to allow dried milk for infants under one was much appreciated, and the council made supplementary grants where they were needed. War-time dinner centres are being set up in large numbers, and are popular; those attending them are being unobtrusively instructed in making the best choice and use of war-time food.

EVACUATION REVIEWED

THE 1939 evacuation was a valuable rehearsal for the much more urgent evacuation of 1940, and those responsible in the reception areas have profited by the lessons their first experience taught them. Mr. Geoffrey Shakespeare's report to the Minister of Health on conditions in reception areas[2] gives a human picture of the city woman transferred to the country and of her country hostess. He makes it quite clear that the secret of success lies in providing the newcomers with social activities which will not only amuse but also occupy them. Social centres, communal feeding centres, occupational clubs, nursery and play centres for children, hostels for visiting fathers and hostels for whole families all help, and some progressive authorities have recognised this and provided these amenities. Others, from caution, lack of enthusiasm, or ignorance of their own powers, have hung back. Nonetheless evacuation is in the main succeeding; unaccompanied children have nearly all settled down well, and many town-dwellers are beginning to find advantages in the country. One need stands out clearly: all areas would benefit from the help

1. *Med. Offr*, Jan. 18, 1941, p. 21.
2. H.M. Stationery Office. *3d.*

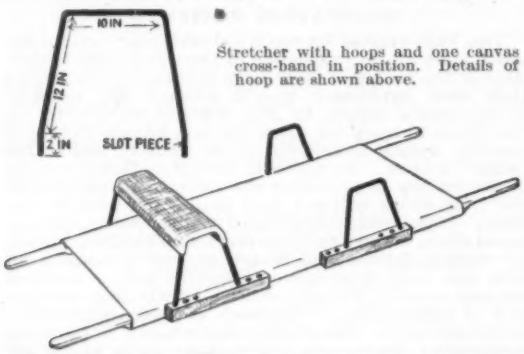
of welfare workers who understand the town-dwellers' point of view. Mr. Shakespeare recommends the appointment of such welfare officers throughout the reception areas to coördinate and stimulate all welfare activities; and these officers should have a knowledge of social legislation, in order to give skilled advice. Their appointment could be made either on a county basis or by the authorities of boroughs or large districts. The welfare officers could ease the burden on local authorities and voluntary workers and keep in touch with local welfare committees; they could also visit the billeted weekly and help to settle points of friction as they arose. One borough which has employed 40 voluntary billeting officers in this way has had excellent results. Points which cannot be settled are referred to the trained welfare officer of the district or to the local welfare committee. Committees of the kind have helped to settle misunderstandings between local authorities and school-teachers in charge of unaccompanied children, and between householders and the billeted. Mr. Shakespeare suggests that more of these committees should be formed, and that representatives of the evacuated population should be coöpted on to them. There is said to be a shortage of women of a suitable type to appoint as welfare officers; Mr. Shakespeare suggests that a selection committee should be appointed by the Ministry of Health, to work with the L.C.C., the Women's Voluntary Service, and the National Council for Social Service to prepare a list of suitable women for submission to the regional officers. These would include L.C.C. care committee organisers, women house-property managers, hospital almoners, public-health officers, and escorts who have shown their worth under the children's overseas reception scheme.

THE PERSONALITY OF ANIMALS[1]

How, do you think, does a screech owl see ?
What sort of clock keeps time for the bee ?
Why does the pigeon strike for home ?
Can a hen tell the colour of a scarlet comb ?
How does the fish, in his midnight swim,
Steer clear of the rocks that encompass him ?
Can he hear your voice ? Will he come at call ?
Has a digger wasp any brains at all ?
What can induce the eel to shove
Off on a journey of death and love ?
Which wears the breeches, hart or hind ?
Did you know that your dog was colour-blind ?
These are the things, all strictly true,
Which Munro Fox has explained for you,
In a Pelican Book which is bound in blue.

LIMB SUPPORTS FOR STRETCHERS

Dr. F. Gordon Cawston of Durban, South Africa, sends us details of a modification of the attachment for stretchers which he described last year (*Brit. med. J.* 1940, 1, 747). The device is intended to keep painful limbs raised during transport. Two metal hoops are



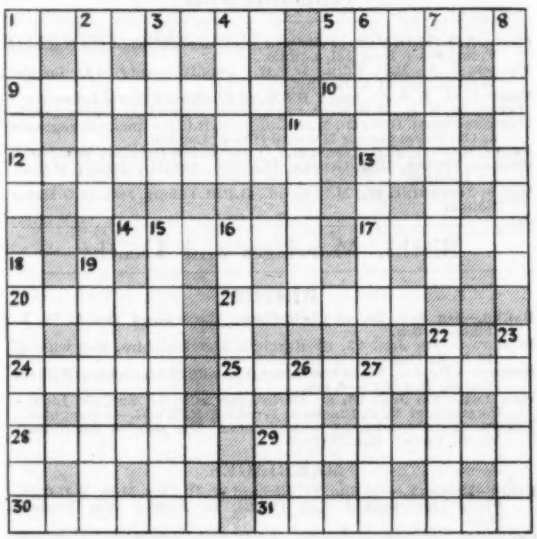
Stretcher with hoops and one canvas cross-band in position. Details of hoop are shown above.

required, made of ¼ in. wire such as is used for the side-bars of a Thomas splint and shaped like croquet hoops (see figure), with a transverse bar 10 in. long at the top and legs 12 in. long bent at an obtuse angle to the bar. The legs are prolonged into vertical slot-pieces 2 in. long, which fit into slots clamped to the side-bars of the stretcher, so that the top bar of each hoop runs parallel with the axis of the patient. The slots are multiple, to allow for patients of various sizes, and are arranged so that the hoops can be fitted at either knee or shoulder level. A cross-band of stout canvas, 2 ft. long and 1 ft. wide, can be stretched across the patient from one hoop to the other, forming a bridge on which the injured limb is laid (see figure). The cross-band is made with wide hems at each end so that it can be threaded on the hoops before they are dropped into the slots. Each stretcher should be equipped with four hoops and two canvas cross-bands, so that both arm and leg can be supported if need be. In tropical countries the canvas can even be used to shade the head.

The hoops bend to cant inwards when the weight of the patient hollows the stretcher; to overcome this Dr. Cawston, in his latest design, has had the slot-pieces of each hoop prolonged below the stretcher for a few inches and connected with the hoop of the opposite side by a strap which can be braced to the right degree of tension to keep the hoops upright. In this variant of the device the hoops are fixed in their slots, and the piece of wood or metal carrying the slots is clamped to the side-bars of the stretcher by movable thumbscrews.

1. By H. Munro Fox, F.R.S., professor of zoology in the University of Birmingham. Harmondsworth: Penguin Books. Pp. 123. 6d.

LANCET CROSSWORD



ACROSS

1. Such particles form a large sun (8).
5. To swallow anything—by way of a joke ? (6).
9. This organiser might take you in (8).
10. Wing tip to wing tip (6).
12. Musical judges (9).
13. Always behind (5).
14. A china tree ? (6).
17. Never trite to the immunologist (5).
20. Rash thing to do (5).
21. With that cough avoid this club (6).
24. A healer returns (5).
25. They are strongly anti-anthelmintic (9).
28. God healed the patient; he closed the plaster (6).
29. Never produced by hard words (8).
30. Some take it for rheumatism, some with cheese (two words, 2, 4).
31. Wrapped up like a peer or an organ (8).

The solution will be given next week

DOWN

1. If you find it in blood, you will certainly get it in the neck (6).
2. Slave of habit—but I must change in 22 (6).
3. It feels something cruel and looks it too (5).
4. Call up ? O.K., Eve (5).
6. Ripen this for serious trouble (9).
7. Not a fang (8).
8. Heads and tails, but mostly heads (8).
11. Thamas takes a turn (6).
15. Might—and in fact does—stop a hole (9).
16. The whitest man I know (6).
18. This would make a cretin C.O. (8).
19. On the dot (8).
22. See 2 (6).
23. The tracts of Goll and Burdach do it ((6).
26. There goes a happy ——
He does not care a damn.
I wish I were a ——
My God ! Perhaps I am. (5).
27. The cheat makes a blot (5).